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VITAMINS AND HORMONES[1]

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THE period of wonderment and amazement regarding the two classes of regulating substances concerning which I am to speak, has given way to a period of familiarity. We are no longer surprised that enormous effects in the physiological economy can be accomplished by extremely small quantities of material. Just at the moment we are concerned to know how far these classes of substances may extend, and particularly to know what are their interrelationships. We shall see that many functions are influenced by both classes of substances in such a way as to leave little room for doubt that they must work cooperatively. Indeed, anyone who contemplates the variety of functions affected by vitamins and hormones, is bound to conclude that the course of normal health must be essentially a matter of harmony of operation amongst them.

I shall not spend much time in reviewing the developments in our knowledge of these substances historically. I will content myself with reminding you only that within a little more than the span of an average generation the first hormone and the first vitamin specifically were discovered and christened, the former in 1903 and the latter in 1911. We are now perfectly familiar with the fact that there had been previous to these dates many foreshadowings of both groups of substances. The vitamins go back in actuality at least as far as 1897 to Eijkmann; some say at least 100 years to Magendie, and others say at least 180 years to the first reliable description of scurvy by Lind. We need not be surprised if some Egyptologist before long announces the discovery that one of the ancient Pharaohs expressed the opinion on tablets of stone, thousands of years ago, that man requires for his nourishment something else than what he chews with his teeth or tastes with his palate, and then we shall have the foundation of vitamins securely fixed in ancient history!

You are well aware that the first explicit name was conferred by Funk, a young Polish chemist, on the substance extracted from rice polishings with alcohol. You remember also how the name as originally spelled came to be shortened, and how we came to designate

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vitamins by letters of the alphabet. It was generally agreed when the letters first came to be used that as soon as the chemical nature of any particular vitamin was known, the chemical name would then be used in place of the letters of the alphabet. Already that stage has been reached and letters are being abolished.

The evidence for hormones goes back at least to Berthold in 1849 and the conception of internal secretions was formulated by Claude Bernard about 1860. The credit for the first clear-cut demonstration of a hormone in the modern sense goes, however, to Bayliss and Starling, (1904) two distinguished English physiologists working at University College in London. They were studying the causes of the secretion of pancreatic juice into the intestine. Previously it had been observed by Pawlow and by Popielski, Russian physiologists, that pancreatic juice begins to flow into the intestine when stomach contents begin to pass from the stomach into the duodenum. One suggestion had been that nerves are stimulated by the acid reaction and that reflexly pancreatic juice is poured out just as reflexly saliva is poured into the mouth and gastric juice is poured into the stomach on excitation by food. Bayliss and Starling had not been able to obtain satisfactory evidence of such a nervous mechanism, and they conceived the idea that the acid reaction of the gastric juice in some way affected the wall of the intestine so as to produce a stimulus in the pancreas by way of the blood stream. To test this possibility, they scraped off the lining of the intestine of a recently live dog, mascerated it in HCl of the same strength as is found in gastric juice, and after the material had extracted for some hours they neutralized the acid, thereby precipitating the proteins, took the filtrate and injected it into the vein of another dog (under anesthesia). This second dog had a cannula or small tube in the pancreatic duct so that the flow of pancreatic juice could be observed. The result was a marked increase in the flow of pancreatic juice, within a few minutes after introduction of this filtrate into the blood stream.

For such a substance Bayliss and Starling suggested the name hormone, derived from the Greek word signifying "I excite" and they spoke of this substance dissolved from the mucous lining of the intestine by the acid, as a chemical messenger, whose business it is to pass from one place in the alimentary tract to another and excite at the proper time the flow of pancreatic juice.

For the hormones we did not make the mistake of conferring names by letters and subscript numerals. Each hormone in general takes in some manner the name which indicates the organ from which it comes, or the organ or function which it affects. Thus—thyroxin, epinephrine, enterogastrone, etc. Not having made the mistake of using letters and numerals, we find the nomenclature of the hormones not nearly so confusing as the nomenclature of the vitamins.

The chemical nature of this class of substances also is rapidly becoming known. Most recent progress has been made in the field of sex hormones and now to our great delight and astonishment, we are finding some similarities in certain instances between the chemical structure of vitamins and that of

hormones. This might perhaps have been predicted but the discovery came in a quite unexpected quarter to most of us. From the slides we shall see where this close chemical relationship exists.

Let me call attention at this point to a few of the new recruits to the already rather respectable army of hormones, on the one hand, and vitamins on the other. Amongst the fat-soluble vitamins there are two new ones now quite definitely described and agreed upon, one designated by the letter K, because it promotes coagulation of the blood. Discovered by two Dutchmen, Dam and Schönheyder (1), who spell coagulation with a k, it was natural for them to think of this letter to designate such a vitamin. So far as we now know, it affects only the coagulation of the blood of birds. Closely related to it is another factor known as the gizzard-erosion factor (Almquist and Stokstad, 2). It is a separate vitamin but has not yet been given a separate letter. The lack of this substance, whatever it may be chemically, results in erosion of the lining of the gizzard of birds, making an ulcer-like area on the surface.

Amongst the water-soluble vitamins, we have a new one designated by the letter P, because it is known to affect permeability of capillaries. It was discovered by Szent-Györgyi and associates (3, 4) only two years ago. It is found closely associated with vitamin C and occurs in lemon juice and the Hungarian pepper, along with ascorbic acid. It cures purpura hemorrhagica but does not cure the ordinary thrombopoenic forms of capillary hemorrhage, as in scurvy. The discovery of this vitamin has cleared up many conflicting reports regarding the influence of vitamin C on capillary hemorrhages. The chemical nature of vitamin P is already rather well established. It is a flavone glucoside, has been obtained from lemon juice in pure crystalline form and has been named *citrin* (3, 4). I shall show you its structure in connection with other vitamins presently.

Confusion still exists and probably will for some time to come in the vitamin B_2 complex; namely, the heat- and alkaline-stable portion of the B complex. It is now clear that what most investigators have been calling vitamin G is really riboflavin, found in milk, eggs, whole grains, and many other foods. It has recently been agreed between the American Society of Biological Chemists and the American Institute of Nutrition that the name riboflavin will hereafter replace the name vitamin G. The possibility is recognized, of course, that other flavins than the one now identified as G may be discovered. In fact, P is a flavin derivative.

The terrible confusion which has existed in the past decade regarding the factor which causes pellagra in man, seems at last to have been cleared up. Elvehjem (5) of Wisconsin and his associates have recently demonstrated that nicotinic acid cures blacktongue in dogs very speedily. Evidence already existed that blacktongue in dogs is caused by the same dietary deficiency as human pellagra. There is no reason why Elvehjem should give this vitamin the name of a letter. Its chemical nature is already known and it only adds confusion to name it also with a letter and a subscript. Doubtless it will definitely replace the old "PP factor."

New light is breaking also with regard

to the remaining fractions in the vitamin B_2 complex. One of these factors quite definitely is responsible for dermatitis in the rat (6). This one is called vitamin B_6. Another called a "filtrate factor" because it is found as a filtrate from alcohol-ether precipitation of liver, has the curious effect of preventing the hair of black rats from becoming gray. This property was reported only a year ago by Agnes Fay Morgan of California. Perhaps in time we shall learn to meet the gray hair problem with a vitamin instead of with dyes.

Turning now to the new recruits in the army of hormones, the principal advance in recent years has been in the clearer recognition of many different hormones produced by the anterior pituitary gland (7). Secondly, we have the demonstration by Rowntree (8, 9) and associates that the thymus gland produces a hormone affecting general growth rate, and especially the rate of development in the line of differentiation when injected into rats through several generations. The pineal gland extract stimulates differentiation but retards growth (10). Finally, we have a whole platoon of new hormones produced by the intestinal mucosa (11). I call your attention to the newest member, the last one on the list, which was discovered in our own laboratory (12).

We shall now look at the entire list of well recognized vitamins and hormones. Probably there are others which should be included in both of these lists, but certainly these are the important ones. New vitamins have been from time to time suggested and later found not to be true entities but only substances already well known which gave somewhat different effects in other species. The same, of course, might be said of the hormones. In general, one may say with satisfaction that the effect of a well characterized hormone or vitamin is the same or at least its action is in the same direction, in different species. A notable exception to this general rule is the fact that the rat can produce its own vitamin C while man seems equally independent regarding B_1. Certain other species have particular requirements but such instances are as yet rare. The common laboratory animals, and for that matter, farm animals, practically all show the effects of vitamin A deficiency, vitamin B deficiency, and so on, just as practically all show the same effects of thyroidectomy or pancreatectomy, wherever these operations can be satisfactorily carried out.

Next we shall consider some of the best known chemical relationships. By means of the slides we shall see that there are certain substances which might properly be called either vitamin or hormone. The best example of this at present is vitamin D. Ludwig and Ries (13) have pointed out that the substance in human skin which is activated by incidence of ultra-violet light to produce vitamin D is eleidin, secreted by the sebaceous glands. This substance belongs to the class of sterols and is very similar to ergosterol. Presumably activation produces exactly the same effect in this instance as it does in the case of the sterol produced by ergot. As soon as it is activated, the substance may be absorbed directly from the sebaceous gland into the circulation and produce all the effects of vitamin D. Now, as a secretion of the sebaceous gland, eleidin might well be called a hormone, but since it cannot be useful

TABLE 1

VITAMINS	HORMONES
Fat-soluble A. Anti-xerophthalmia General growth Epithelial structures Resistance to infection (?) Ovulation D. Anti-rachitic Absorption of Ca. Growth of bones and teeth High Ca of blood Tetany Calorigenic in large doses E. Anti-sterility Placentation in female Gametogenic in male Muscle-nerve development in young Growth (?) K. Anti-hemorrhagic (chick) Gizzard-erosion factor (chick)	Hypophysis A. Anterior Pituitary 1. General growth (somatotropic) 2. Gonads (gonadotropic) 3. Mammary gland (lactogenic) 4. Thyroid (thyrotropic) 5. Adrenals (adrenotropic) 6. Pancreas (pancreatropic) 7. Liver (ketogenic) 8. Parathyroids (parathyrotropic) B. Pars-intermedia (chromatophorotropic) C. Posterior Pituitary 1. Pitressin—blood pressure 2. Pitocin Smooth muscle Ovary (interstitial) 1. Estrone (follicle) Secondary sex traits Uterus Mammary gland 2. Progesterone (corpus luteum) Uterus endometrium Pregnancy
Water-soluble (B_1) Anti-neuritic-heat labile (thiamin) General growth Neuro-muscular strength Appetite Metabolism of C—H (B_2) Required by birds Growth (B_4) Required by rat and chick Anti-paralytic (B_3) Complex—Heat stable G. (Riboflavin) Anti-cataract General growth Anti-dermatitis H. Combination of several following: B_6. Anti-acrodynia (rat) PP. Anti-pellagra (man) (nicotinic acid) Anti-blacktongue (dog) Filtrate-factor Anti-gray hair	Testis (interstitial) Testosterone Adrenal A. Medulla Epinephrine (adrenalin) Cardiac stimulation B. Cortex (cortin) Carbohydrate metabolism Thyroid (thyroxine) Oxidation rate Growth Parathyroids (parathyrin) Calcium metabolism Thymus Growth (precocity) Pineal Gland (precocity)

TABLE 1—*Concluded*

VITAMINS	HORMONES
C. Anti-scorbutic (ascorbic acid) Condition of capillaries Nourishment of teeth Calcification of bones	Pancreas (islet tissue) Insulin Carbohydrate metabolism
P. Anti-permeability Cardiac stimulant Diuretic	Stomach 1. Gastrin 2. Ventriculin
	Intestine 1. Secretin 2. Incretin 3. Enterogastrone 4. Cholecystokinin 5. Enterocrinin

to the body until it has been activated from outside it partakes more of the nature of a vitamin. This leads us to the suggestion which has been made more than once, that vitamins might properly be regarded as exogenous hormones or hormones may be regarded as endogenous vitamins.

Looking at the chemical relationships amongst the different sex hormones, we are surprised to find a considerable number of naturally occurring compounds, several of which can function to a greater or less extent. Potency differs according to the nature and position of the prosthetic groups and also the position of the double bonds in the ring structure. But the surprising thing is that certain esters which so far as we know do not occur at all in nature may be more potent than any of the natural compounds. The explanation probably lies in the slower rate of absorption and therefore a slower rate of metabolism of the esters. Nothing could be more clearly demonstrative of the conclusion biologists have often been forced to adopt; namely, that evolution apparently has yet more progress to make.

I am showing you next a slide which I prepared six years ago in order to bring out some interrelationships then already clearly discernible, when the actions of vitamins and the actions of hormones were compared. The cross-lines between the two lists indicate related effects; for example, general growth is provided for by vitamin A and by the somatotropic hormone of the anterior pituitary. Ovulation is affected likewise by vitamin A and also by the gonadotropic hormone of the ovary, called ordinarily, the follicle-stimulating hormone or prolan A. Several other instances of this coincidence of effect on the part of a certain vitamin and on the part of a certain hormone can readily be made out. You will observe that the list of vitamins at that time well known was considerably shorter than it is today. The same may be said of the hormones although there were several purposely omitted six years ago merely to get two lists of comparable length. Contrast this with the length of the lists you have already seen under both captions. When we come to consider interrelationships between vitamins and hormones, the number of lines which would have to be connected from one of these lists to the other would be so great

as practically to wipe out the space between them. I have not been able to think up a suitable diagram which would show these relationships without multiplying the number of slides considerably.

To offset this lack of a suitable diagram, I am going to give you some specific instances of interrelationships which are much more satisfactory than the general and largely inferred relationships shown in the slide made six years ago.

VITAMIN A AND THYROXIN

For example, there have been many reports of a relationship between vitamin A and thyroxin. Abelin (14) in 1930 showed that in rats experimental thyreosis which corresponds to our word thyrotoxicosis could be ameliorated with a vitamin rich diet, and vitamin A seemed at that time to be the most important constituent of the diet. He also pointed out that vitamin A has a direct effect on the incretion of thyroxin. Van Euler and Klussmann (15) in 1932 were the first to give proof that the growth effect of vitamin A could be largely nullified by administration of thyroxin, also that the accumulation of vitamin A in the liver could be prevented by thyroid feeding. The next year Fasold and Peters (16) found that hypervitaminosis A characterized by cacachexia, skin changes, bleeding diarrhea, fragility of bones, etc. could be cured speedily or prevented entirely by thyroid feeding. One of the most interesting reports along this line is that of Fasold and Heidemann (17). They observed that goats normally produce a milk which contains vitamin A and but very little carotene. The removal of the thyroid caused the goat to secrete carotene in sufficient amount to color the milk considerably, but now it contained very little vitamin A.

Wendt (18) finds that the vitamin A content of the blood serum in Grave's disease or exophthalmic goiter, is very low. The explanation seems to lie in the fact that in this disease there is an excessive production of thyroxin, which causes acceleration of oxidative metabolism and consequent destruction of vitamin A. When thyroid in 0.2 mg. doses was given to rats, Sure and Buchanan (19) found that the rats developed xerophthalmia on amounts of vitamin A which were ample protection without thyroxin.

Rappai and Rosenfeld (20) studied the respiratory metabolism of rats injected with 50 gamma of thyroxin, repeated every second day. Metabolism rose 30 to 40 per cent. After five weeks one animal showed a respiratory metabolism 62 per cent above normal. These are not unusual figures, but the point to the experiment was this: After the metabolism had been raised to the neighborhood of +30 to +50 per cent by administration of thyroxin, administration of vitamin A over the next two weeks along with the thyroxin, brought the metabolism down to +16 per cent.

More recently, Fasold (21) found that in young women with endemic goiter, treatment with vitamin A (to the extent of 30 drops "Vigantin") every third day caused the goiter to disappear in the course of 3 or 4 weeks and, curiously enough, the menses ceased entirely or recurred at longer intervals. After 7 to 8 months of vitamin A administration, on discontinuance the endemic goiter returned, as did also the menses. The

relationship between the thyroid and ovary at puberty, which is well known from the fact that the thyroid ordinarily becomes slightly enlarged at this age, also is antagonized by the administration of vitamin A. One could give many other illustrations of this relationship between thyroxin and vitamin A. One other will suffice, because it concerns not thyroxin itself, but the thyrotropic hormone of the pituitary.

This hormone, you recall, produced in the anterior pituitary gland, acts upon the thyroid to stimulate it and keep it in functional condition. When injected into a normal animal the thyrotropic hormone causes enlargement of the thyroid. Fellinger and Hochstadt (22) find in the case of guinea-pigs that vitamin A protects the thyroid against this stimulating effect of the thyrotropic hormone.

Let us look now at vitamin B and its relation to some of the hormones.

THIAMIN (B_1) AND HORMONES

Sure and Smith (23) found that large amounts of thyroxin counteracted the good effects of vitamin B_1. Conversely, large amounts of vitamin B_1 because of the effect on appetite and consequent increased food intake, serve to offset the increased catabolism caused by thyroxin. These are experiments on rats.

Vitamin B_1, or thiamin, is known to affect carbohydrate metabolism. There have been a great many reports to this effect. One of the most striking is the recent report by Vorhaus, Williams and Waterman (24). They used the newly crystalline vitamin B_1, thiamin chloride. Administration of only 10 mg. of this product daily to diabetics seemed to show definite increase in the utilization of carbohydrate. In other words, thiamin has an insulin-like action. There have been contrary reports, however; for example, Monauni (25) injected pure vitamin B_1 but never was able to produce any appreciable decrease in blood sugar in human diabetes, and in some instances there was actually an increase 3 to 4 hours after injection. On further analysis he found that thiamin is antagonistic to insulin in persons who are highly sensitive to that hormone, but synergistic to insulin, that is, acting in the same sense, in persons less sensitive.

Thiamin also shows a relationship to the anterior pituitary. You remember this gland produces a hormone antagonistic to insulin. When dogs are kept on a thiamin deficient diet they show an increase in the blood sugar. But when the hypophysis is removed, according to Braier's (26) observations the B-deficient diet produces no rise in blood sugar. Evidently the lack of thiamin somehow excites the diabetogenic hormone of the anterior pituitary.

This vitamin also shows an interrelationship with the testes. The secretion of male hormone is reduced by a thiamin-deficient diet. Partial inanition, as well as thiamin deficiency causes changes in the rat prostate and seminal vesicles which are promptly relieved, according to the observations of Moore and Samuels (27), by the administration of testis hormone. In both cases, that is, thiamin deficiency and inanition, the real injury is believed to lie in the anterior pituitary, since the testicles of such thiamin-free, or partially starved, animals respond immediately to hypophyseal extracts and secrete large amounts

of hormone. Again the converse relationship comes out; the hypophyses in thiamin-free animals have a lowered capacity to stimulate the gonads of immature animals.

Note this observation also concerning the relationship of the B vitamins to the adrenal gland. It is well known that in certain animals hypertrophy of the adrenal follows severe muscular exercise. This can be prevented by brewer's yeast, which supplies all of the B vitamins. Perjes (28) noted that neither G, *i.e.* riboflavin, nor B_1, *i.e.* thiamin, had this power to prevent adrenal hypertrophy. The effect therefore must come from one of the other B_2 vitamins.

ASCORBIC ACID AND HORMONES

Vitamin C, which has recently become generally available as crystalline ascorbic acid, has many interesting relationships to the hormones. Some suggestion of the organs in the endocrine series which may have an affinity for vitamin C, is found in the distribution of ascorbic acid amongst the different ductless glands. For example, Mendive and Deulofeu (29), using the colorimetric method for determination of ascorbic acid in the glands of slaughterhouse beef, found that it occurs in largest quantity in the hypophysis, next in the corpus luteum, and next in the adrenal. Following these came the thymus, spleen, testes, pancreas and thyroid. Corresponding with this distribution as found in normal animals, one would expect that the hypophysis would retain ascorbic acid longer on a vitamin C deficient diet than other organs.

Giroud and associates (30) found in fact, that this is true of the guinea-pig. Not only did the vitamin C content of the hypophysis decrease more slowly when the animals were placed on a scorbutic diet, but it remained on a higher level than that of any other organ.

In 1928 Szent-Györgyi discovered that the adrenal gland contains a great deal of vitamin C. This observation has been confirmed many times, and there have been many speculations as to its meaning. Every year comes new light on this question. It was surmised, for example, as soon as the richness of this gland in vitamin C was well known, that if the adrenal glands were removed from an animal which, like the dog or the rat, ordinarily is resistant to a vitamin C free diet, these animals would develop scurvy. Svirbely and Kendall (31), however, have found this is not true in the dog. It seems therefore that the adrenal gland in the dog, at least, is not the only site of the production of vitamin C.

Hartman and his associates (32) at Ohio State University have recently thrown some light on this question. You remember Hartman is responsible for the name cortin given to the hormone produced by the cortex or outer layers of the adrenal gland. An extract of adrenal cortex of beef was prepared free of ascorbic acid. Guinea-pigs brought into a scorbutic condition on a vitamin C free diet, were then injected with this pure preparation of cortin. The result was relief of the symptoms of scurvy. An extract of liver prepared in the same way did not relieve scurvy. There was not complete protection from the use of cortin, and for this reason, because the dose was adequate if vitamin C had been present, Hartman reasons that the substance which gives relief cannot have been ascorbic acid. Either cortin itself, or some unknown substance from the

cortex is responsible for this antiscorbutic effect. Quite possibly there will be found in the cortex a substance closely related to ascorbic acid in its action but not identical with it chemically. If this should be shown, we should have an additional reason why "vitamin C" is found in large quantity in the adrenal gland. One might suppose that the substance which is not ascorbic acid, and which nevertheless has a vitamin C action, might be an intermediary substance in the process of ascorbic acid formation within the gland.

With reference to human subjects, Schneider and Widmann (33) have reported that the intravenous administration of 50 to 100 mg. ascorbic acid decreases the serum globulin but increases the serum albumin and causes a decrease in the blood sedimentation rate. That is to say, the blood is more viscous. They find also that the serum contains more ascorbic acid in individuals under 30 years of age than in older individuals. Studying guinea-pigs, these authors found that whereas injection of anterior pituitary hormone alone caused increase of the adrenal cortex, the administration of the same hormone with vitamin C caused the entire adrenal gland to become enlarged to as much as 100 per cent. In other words, the medullary portion of the adrenal responds to the combined treatment, whereas the cortex alone responds to the anterior pituitary.

Various kinds of influences can cause a decrease in the ascorbic acid of the adrenal gland. In rats, light ether anesthesia, adrenalin, or glutathione will cause the ascorbic acid to drop to the neighborhood of 35 per cent of its original level. Electrical stimulation and fright also in these animals cause decrease in ascorbic acid content (Kuchel and Mitchell, 34).

Concerning the relationship of vitamin C to the thyroid gland we have a number of recent interesting observations. Oehme (35) has reported that 20–25 mg. of ascorbic acid daily suppresses the increased metabolism caused by 100 gamma of thyroxin. Mosonyi (36) reports also that the increased metabolism during vitamin C administration to scorbutic subjects is definitely due to hyperthyroidism. In other words we have here the same sort of reciprocal relationship between a vitamin and a hormone which we have already seen several times. Liver glycogen in the guinea-pig, according to Hirsch (37), has been raised as much as 60 per cent by injection of 25 mg. of ascorbic acid intraperitoneally over a period of 24 days. It is well known that administration of thyroxin causes reduction of the liver glycogen. Hirsch finds, however, that this effect can be inhibited or stopped completely by a simultaneous or previous administration of ascorbic acid. The combination of ascorbic acid with cortin would not produce this effect. This tends to confirm Hartman's observation that whatever there is in the cortex of the adrenal, producing antiscorbutic effects in the guinea-pig, cannot be identical with ascorbic acid.

Löhr (38) was able to reduce blood iodin below normal, both in normal and in thyroidectomized dogs and also in patients with Grave's disease, by administration of ascorbic acid. In the Grave's disease he reports clinical improvement as to pulse rate, increase in body weight, and subjective feelings, but there was no decrease in basal metabolism. Ascorbic acid therefore

seems not to be the direct antagonist of thyroxin in the sense that it acts oppositely on energy metabolism.

There are many other reports to the same general effect that the rôle of thyroxin with reference to carbohydrate metabolism, particularly the influence of that hormone on mobilization of glycogen, is directly antagonized by ascorbic acid. As we might expect also, anything which antagonizes thyroxin is likely to have the same effect following thyrotropic hormone administration. On the other hand we cannot reason that because a vitamin affects certain phases of thyroxin action physiologically, it will therefore affect all others. Schroeder and Dormann (39) find, for example, that ascorbic acid has no effect on the thyroxin action in tadpoles. We are all familiar with the fact that thyroxin accelerates the metamorphosis from the tadpole to the frog. Vitamin A antagonizes this action. Vitamin C does not.

We have already learned that ascorbic acid is especially concentrated in certain glands having to do with reproduction. Biskind and Glick (40), finding vitamin C especially abundant in the corpora lutea of cows, suggest that this vitamin is essential to the formation of progesterone. Whether it acts by maintaining the integrity of the structures responsible for the production of progesterone or more directly by influencing the chemical reactions concerned therewith, these investigators do not decide. Further evidence of the relationship of this vitamin to the ovary is found in the observations of Giedosz (41) who reports that in the scorbutic guinea-pig there is no formation of ovarian follicles, or, if ovarian follicles are already formed when scorbutus sets in, they immediately undergo atresia. Ley (42) also finds evidence that vitamin C has an especial affinity for the ovary and the amounts so retained seem to be definitely related to the functional state of the organ.

VITAMIN D AND HORMONES

There is considerable evidence that vitamin D because of its relationship to calcium metabolism is hitched up in its physiological action with the function of the parathyroid gland. Indeed, there are those who tell us that after parathyroidectomy animals can be kept in perfect condition with vitamin D. Kozelka, Hart and Bohstedt (43) reported that adult dogs deprived of both thyroid and parathyroid lived satisfactorily on 13 rat units of vitamin D daily, but when pregnancy supervened tetany could not be prevented with less than 26,000 units and during lactation the requirement rose even to 40,000 units. These figures strikingly illustrate the increased requirements of the organism for calcium during pregnancy and lactation. Nevertheless, large as they are, these demands can be met with the aid of vitamin D or with the aid of parathyroid hormone interchangeably.

Viosterol when given in large amounts exhibits much the same effect as parathyroid extract. It raises the calcium level in the blood and in the excreta and it also increases the calcium absorption from the alimentary tract. There is this difference, however; vitamin D effects last much longer. It also requires more time to establish the vitamin D effect. Therefore in an emergency parathyroid hormone is to be preferred to vitamin D, but where the demand is going to be continuous over a considerable period of

time vitamin D is to be preferred (Aub, 44).

The effect of vitamin D on the thyroid gland is not so well known. In fact, there seems to be some doubt as to whether any such relationship exists at all. Reed and his associates (45), for example, find that the calorigenic action of vitamin D, which they and others have reported when the vitamin is given in huge doses, bears no relationship whatsoever to the thyroid gland. They were concerned to prove that the thyroid was involved. This was done by testing large doses on thyroidectomized animals. However, Thiersch (46) has found that when rabbits are given 20 cc. of 50 per cent ethyl alcohol and as little as 1/10 mg. of viosterol there is a great increase in the size of the thyroid gland and a great deal of calcium is deposited in the aorta of these animals. This observation may possibly open up a significant lead in the etiology of arteriosclerosis.

VITAMIN E AND HORMONES

We come now to vitamin E. One would expect that vitamin E would exhibit some definite relationship to the sex glands, concerned as it is with the implantation of the ovum in the uterus and with the production of male sex cells. One need go no further for evidence that the vitamin is related to the gonads.

The question has arisen whether this relationship is a direct one or whether the sex hormones act entirely independently of the vitamin. According to recent observations in Russia (Kudryashov, 47) the sexual cycle in the female can be maintained perfectly in complete absence of vitamin E. This indicates, of course, that the hormone is independent of the vitamin. Much to the same effect are the observations of Marchesi (48) that ovarian grafts introduced into rats with manifest symptoms of vitamin E deficiency restored their reproductive functions to a moderate degree. Placental extract was even more successful. Gonadotropic hormones do not seem to bear any definite relationship to vitamin E. At all events Diakov (49) has shown that vitamin E cannot be replaced by protan A or other anterior pituitary hormones. One would hardly expect that they could, for the gonadotropic hormone is responsible only for ovulation and fertilization of the ovum whereas vitamin E promotes development of the foetus and a normal placental relationship between the mother and foetus.

There are only a few observations with reference to the relationship of vitamin E to other hormones. We have known of course for a long time that E is rather more specific in its action in the body than are the general growth hormones like A, B_1, and G, as well as C. We should hardly expect deficiency of vitamin E, for example, to affect the function of the pancreas as regards its internal secretion. With reference to the thyroid there is the interesting observation of Barrie (50) that symptoms of cretinism appear in young rats deficient in vitamin E. Various other nervous symptoms and a very definite form of paralysis, as many of you are aware, have also been described in relation to this deficiency in young rats.

GENERAL CONSIDERATIONS

Many of these experiments indicating interaction of vitamins and animal

hormones do not, of course, permit the interpretation that a hormone waits for a special influx of vitamin to exercise its function. Insulin probably acts without special regard to the level of thiamin so long as there is no obvious deficiency. Partial starvation produces effects on the testes similar to that of thiamin deficiency. Nobody would infer from this coincidence that an abundant supply of thiamin could substitute for the other constituents of the diet.

There are many points in all this array of evidence for interrelation which should be, and will be in time, subjected to the most trenchant criticism. Some of the observations I have mentioned, as for example the quite evident antagonism on the part of vitamin A and thyroxin, are already well buttressed with collateral evidence. The clinic and the laboratory about equally have contributed to this knowledge and it is receiving application both in the work of the physician and that of the dietitian. Other parts of the complex picture I have drawn doubtless will fade out with age. The whole field of vitamins and hormones has been so alluring that many incompetent workers have been drawn into the experimental investigations. Hasty conclusions have been drawn. Much revision is required before we shall have all parts of the picture equally well delineated.

I call your attention to one quite prominent tendency already in evidence. The two fields of investigation, vitamins on the one hand and hormones on the other, with the appearance of multitudes of vitamin concentrates and crystalline hormones, are being rapidly merged into the general field of pharmacology. We rely upon the dietitian to tell us what foods contain the vitamins. We rely upon the physiologists and biochemists to tell us how to prepare hormones; but when it comes to giving hundreds of thousands of units of vitamins and with chemically pure crystalline hormones in quantities far beyond what the body normally produces, the pharmacologist must necessarily be looked to for animal tests of these larger doses and these more potent preparations. But the dietition is in a position to tell the physician where and how abundance of the various vitamins may be supplied in our everyday foods. Spurred by artistic and sometimes blatant advertisements people are being driven to the drug stores for vitamin concentrates, and physicians are being importuned for hormone preparations designed to restore to their patients lost vigor of function, lost appetite and many other depleted functions. Whither are we tending in this matter? Shall we continue to gorge enormous doses of vitamins in the expectation of somehow coming out superior to our fellow men? And shall we go on administering hormones to people deficient in those important physiological factors, even though there is good reason to believe that by so doing we shall only generate more and more people, more and more deficient? If I have stimulated your interest in these extremely important biological substances and particularly if I have provoked you to look into the literature yourselves and learn what is going on, far beyond the expectation of everyone ten years ago, the purpose of this lecture will have been accomplished.

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SOME PUBLIC HEALTH ASPECTS OF FOOD[1]

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THE relationship of food to public health may be considered from several points of view. This discussion is concerned with food-borne bacterial infections and intoxications in humans. Tuberculosis, scarlet fever, diphtheria, septic sore throat, and typhoid fever are frequently spread by food, especially milk. The manner in which these diseases are spread and controlled is rather well understood by the public generally, and they will not be considered further. In this paper attention will be focused on some less widely understood types of bacterial infections and intoxications, and the discussion will thus be limited to so-called food poisoning, botulism, and undulant fever.

The cause and nature of food poisoning are not generally well understood by the public. Most outbreaks of illness of this kind are attributed to "ptomaine poisoning". This term, a relic of the infancy of the science of bacteriology, has all but been discarded by scientists, but it is still employed by laymen to explain acute gastro-intestinal illnesses characterized by sudden onset, severe symptoms, short duration, and a very low fatality rate. The symptoms commonly observed include nausea, vomiting, diarrhea, and general prostration.

PTOMAINE POISONING

Ptomaines are poisonous substances produced in the process of bacterial decomposition of protein foods. If ptomaines should be present in sufficient quantity in the food one eats, illness could result. However, long before such a concentration of ptomaines could be produced, the food would be so badly decomposed that no civilized person would eat it.

Scientists now know that illnesses commonly termed "ptomaine poisoning" are, in reality, caused by bacterial infection of the alimentary tract. Ptomaine poisoning, therefore, is largely discredited as a cause of illness. The late Dr. E. O. Jordan (1) of the University of Chicago thus disposes of the subject: "It is possible that cases of 'ptomaine poisoning' in man . . . sometimes occur, but there is no doubt that such cases, if they occur at all, are very rare." He adds: "It still remains to be proved that the ptomaines play any really important part . . . in food poisoning, or in the so-called gastro-intestinal intoxications."

Tanner (2), in summarizing the objections to ptomaine poisoning as a cause of illness, states that the toxicity of ptomaines isolated from putrefied foods has not been satisfactorily established. He states further that symptoms of ptomaine poisoning are too inconclusive, and that investigations of outbreaks of illnesses thought to have been caused by ptomaines have revealed more satisfactory explanations, such as Salmonella infections and botulism.

FOOD POISONING

This leads logically to the consideration of those frequently occurring out-

[1] Contribution No. 290 of the Massachusetts Agricultural Experiment Station. Read before the Massachusetts Dietetic Association, Massachusetts State College, Amherst, October 2, 1937.

breaks of acute gastro-intestinal illness caused usually by bacteria of the Salmonella (paratyphoid) group or by *Staphylococcus aureus*, and commonly termed "food poisoning".

The beginning of our knowledge of food poisoning goes back to 1888 when Gaertner, in Germany, isolated an organism, known then as *Bacillus enteritidis*, from a fatal case of illness which quickly followed the eating of contaminated meat. This organism is now known as *Salmonella enteritidis*, and it has been reported (3) that at least twenty-seven closely related bacteria of the Salmonella group are known to have caused outbreaks of food poisoning. The attack generally comes on within a few hours and is accompanied by fever; acute intestinal symptoms including diarrhea, nausea, and vomiting; and great prostration. The symptoms are attributable to actual infection by the organism, rather than to a preformed toxin as in botulism. The mortality rate is usually quite low and recovery is prompt and uneventful. One outstanding characteristic of food poisoning is the frequency with which a large number of people are infected from a single source, as at public dinners.

A wide variety of foods may carry bacteria of the Salmonella group. Meat products, especially cold cuts and canned meat and fish, are perhaps the most common sources of infection; but dairy products, including milk, cream, ice cream, and cheese, are not uncommon sources. Custard-filled pastries are frequently involved; and cases occasionally result from eating various infected vegetables, especially beans and peas. Even such an unusual product as pineapple jelly has been reported (from England) as having been the source of an infection. Thus it seems that almost any food can convey food poisoning if an infective organism is present, and the food has been improperly cooked or improperly stored after its preparation. Tanner (2) lists a number of outbreaks of food poisoning in which the circumstances, number of cases, and sources of infection are given.

The question arises: how do the organisms responsible for food poisoning get into the food? Where meats are sources of infection, the organisms may come from infected animals. It is unfortunate that in most instances the food which is responsible for the illness is not available for examination; and if meat is the source, the butchered animal is even less frequently available. Rats and mice are considered responsible for many cases of infection. *Salmonella typhimurium*, often identified as a cause of food poisoning, is the cause of disease among rodents which are probably responsible for contaminating food with their droppings. Flour and sugar in bins could easily be contaminated in this way. It is thought that custard and cream fillings are frequently so contaminated. Insects, especially flies and cockroaches, may help to spread infective material dropped by rodents. Human carriers must be considered as potential sources of the infective organisms. In this connection, Tanner states that there is no reason for not admitting that carriers of members of the Salmonella group may be as common as carriers of the typhoid bacillus.

Another cause of food poisoning, more recently discovered, is *Staphylococcus aureus*. This organism is the common cause of boils and of pus-forming infec-

tions in skin injuries such as cuts, bruises, and puncture wounds from splinters. As early as 1914 it was suggested that the Staphylococcus was the cause of milk poisoning, but it was not until 1930 that Dack and his associates (4) discovered that *Staphylococcus aureus* was responsible for outbreaks of food poisoning which involved several different kinds of foods infected with the organism. This observation was verified by Jordan (5, 6). Dack (7) states that cream-filled pastries and cakes are the most frequent sources of Staphylococcus food poisoning, but other kinds of foods have also been incriminated.

In addition to the Salmonella group and *Staphylococcus aureus*, it has been reported that another group of bacteria, the Proteus group, has been suspected of causing food poisoning. According to Tanner (2), the evidence that members of this group of bacteria are the cause of outbreaks of food poisoning is not convincing, and the reports of outbreaks are unsatisfactory and incomplete.

Space is not available for a consideration of the methods of preventing food poisoning, and only a few factors of safety are mentioned here: Food should be purchased carefully from establishments known to offer good quality merchandise and to have clean quarters. Such establishments should control rodents and insects, especially cockroaches and flies. There should be careful inspection by public health officials of all places where food is prepared and offered for sale. Those who prepare or handle food should be careful of their personal cleanliness; and lastly, all cooking should be thorough and refrigeration should be prompt and adequate.

BOTULISM

Food intoxication, or botulism, is another serious public health menace. Botulism is not so prevalent as is food poisoning, but its high fatality rate makes it a much more dreaded ailment. It is not the purpose here to consider the bacteriology or symptoms of botulism. It is sufficient to say that the symptoms are caused by a toxin preformed in the food, before it is eaten, in contrast with the previously discussed food poisoning in which the bacteria cause infections and liberate their toxins within the human body.

Clostridium botulinum, known also as *Bacillus botulinus*, is a spore-bearing anaerobic organism which exists in soil in the spore state. When canned food contaminated with such spores is improperly processed, the spores germinate into the bacteria which then produce the deadly toxin. A food may be unfit for use, even though there is no evidence of spoilage. This may also be true in instances of food poisoning.

The purpose of this discussion is to stress two points: First, the importance of proper methods of home canning; and, second, the wide distribution of the *Clostridium botulinum*. The most usual source of botulism is food improperly canned in the home. Non-acid foods, especially protein foods such as meats, beans, peas, and corn, are the most usual, but not by any means the only, sources of botulism. Steam-pressure sterilization is the only safe method of processing canned non-acid vegetables and meats. Tanner (8) emphasizes this in a timely publication in which he states that in the period from 1925 to

the date of his statement no outbreaks of botulism were caused by factory-canned foods in America, while home-canned foods cause numerous outbreaks each year. He adds: "Non-acid vegetables and meats should be processed only under steam pressure and not in the oven or boiling water bath". The United States Department of Agriculture recommends the same procedure in *Farmers' Bulletin* 1471. Relatively few of the state extension services have, according to Tanner, "... seen fit to adopt similar recommendations." Directions for home canning furnished by many manufacturers of canning supplies are equally inadequate. For a frank discussion of the importance of proper methods for home canning this article by Tanner is recommended.

Clostridium botulinum is widely distributed, probably all over the world. Numerous cases of botulism have been reported from all parts of Europe, including the British Isles and Russia, and from many parts of the United States. Meyer and associates (9) made extensive studies of the prevalence of *Clostridium botulinum* spores in soils, and found the organism to be present in soil samples from all parts of the United States and from many European countries. The prevalence of botulism in the western part of the United States is recognized. The eastern section of the country has been relatively free from cases, and for that reason a feeling of security from botulism has grown up there, particularly along the Atlantic seaboard. It appears, however, that there is some danger, even in these regions. Meyer and associates, for instance, reported finding spores of *Clostridium botulinum* in soils from all but one of the New England states, and from Pennsylvania, New York, New Jersey, and other coastal states further south. Cases of botulism from home-canned foods have been reported from several parts of New York State (2) and a typical example was recently reported from New Jersey (10).

While it must be admitted that the danger from botulism is much less in the eastern than in the western part of the United States, the fatality rate of the intoxication is so high that it is unwise to follow inadequate methods of processing home-canned foods, especially when pressure sterilization of foods greatly reduces spoilage in general.

UNDULANT FEVER

In addition to food infection and food intoxication, another food-borne bacterial disease, undulant fever, has been attracting increasing attention in the United States among health authorities and physicians. Malta fever has been known for some years in Europe, particularly in the countries bordering on the Mediterranean Sea, but it is only within the last two decades that we have become aware of the prevalence of undulant fever, a practically identical disease, in the United States. It was known that Malta fever was contracted from drinking the milk of infected goats. It is now known that the milk of cows infected with contagious abortion can transmit undulant fever to those who drink the milk. Those who handle the meat or the carcasses of diseased animals may also become infected. Goats, cattle, and hogs are the domestic animals most frequently affected, but sheep,

fowl, and other animals may have the disease.

The infecting organism, *Brucella abortus*, has been found to be almost identical with that which causes Malta fever. Animals, especially cattle, infected with the organism abort their young, and the disease in these animals is called contagious abortion.

Undulant fever is an important public health problem because of its prolonged debilitating effect on those ill of the disease, and the tendency of physicians to mistake its symptoms for those of other diseases. The disease is characterized by intermittent spells of fever. In its early stages it may be confused with typhoid fever; later, rheumatic pains develop which may be attributed to arthritis or to muscular rheumatism; the disease is sometimes characterized by gastro-intestinal symptoms which may lead a physician to suspect appendicitis or some other enteric ailment. The fatality rate is low, but the debilitating effects of the disease are so lasting that it constitutes a real public health problem.

Control of undulant fever is best effected by the detection and eradication of diseased animals, principally cattle in the United States, and by pasteurization of all milk unless its source is known to be free from the disease. The eradication of infected cattle is important, also, in freeing herds of contagious abortion which is a source of considerable economic loss to dairymen.

An excellent source of information concerning the public health aspects of undulant fever, also called brucellosis, is a monograph recently published by Giltner (11). The reader is referred to this monograph, and also to standard text books of bacteriology for further information. Detailed discussion is not included here, the purpose being to stress the fact that undulant fever is an important public health problem because of its obscure character, the frequency with which it may be mistaken for other diseases, and the prolonged debilitation of those infected.

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NEW SOURCES OF VITALITY FOR THE PEOPLE[1]

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EMERGING from the drama of conflict and depression and doubt of the last few years in this country, two parallel purposes now seem everywhere clear and dynamic. These are the motivations to conserve, develop, and make more useful the two great sources of the good society; namely, our natural wealth and our human wealth. It is fortunate that these two great purposes are being more and more envisaged as inseparable in any adequate program of continuing education and planning. It is especially fortunate that we can so often work for the desired and attainable ends of both in separate and specific programs inaugurated for one.

Such is the case where we seek the enrichment of the people through new sources of vitality in this age of drain and exhaustion, in so far as we rededicate our natural wealth to the people and reconstruct our agricultural and chemurgic programs for regional economies of abundance.

While this theme is of prime importance throughout all the varying regions of the United States and in the nation as a whole, the South appears to afford an admirable testing ground for the twin development of natural and human wealth, in both of which we excel in the quantitative and possibly qualitative measures, and in both of which we reflect a large measure of waste. The situation, therefore, offers a distinctive field for such an important group as the American Dietetic Association to consider both the general opportunity and specific ways and means of making genuine contributions.

May I discuss the theme very briefly under three divisions. The first has to do with the present universal situation which I have characterized as a new realism of the people. The second has to do with the superabundance of children and young people in the South for whom we need a greater abundance of physical and nutritional vitality. The third has to do with measures of deficiency in these sources of vitality.

In re-emphasizing this new reality of the people, I pointed out something of the present situation, as I see it, at the 19th National Triennial Convocation of Phi Beta Kappa last month at Atlanta. It is that in this new day of powerful movements, great change and epochal opportunity, the people are the center and symbol of our wealth and welfare, of whatever power and glory may be inherent in a great civilization. These people are not merely numbers or statistical units, or charts or graphs of population studies, but they are a living, striving, battling folk. They are not merely statistical aggregates for a year, but living folk for the ages: timeless, spaceless, of, for, and by the people sometimes pointing the way ahead for the next great period of progress, vibrant with the promise of a new day, or perhaps unless conserved and developed, symbolic of the long road back.

[1]Read before the Annual Meeting of the American Dietetic Association, Richmond, Virginia, October 18, 1937.

The American ideal has always insisted that it is through the vigor and freshness of a strong and virile people, and through the orderly development of their capacities and institutions, that we must attain stable and enduring civilization. Thus the popular ideal upon which the nation was founded rests also upon a scientific basis in which the people as individuals, as geographic units, and as regional component parts of the nation, constitute the elemental factors out of which the nation has been fabricated. This realism of the people has been recognized in many varied forms through varying periods of history, such that I have sometimes said that the common people, the mass folk power, appears as a sort of universal constant in a world of great variables. It is in this sense that the old *vox populi vox dei* represented an organic truth paraphrased in a thousand ways by a thousand spokesmen. Thus Woodrow Wilson's picture, "The great voice of America does not come from seats of learning. It comes in a murmur from the hills and woods and the farms and factories and the mills rolling on and gaining volume until it comes to us from the homes of common men. . . ."

This powerful and elemental force of the people is not only reflected in its romantic, heroic, beautiful episodes; in the sweep and power of epic movements toward freedom, justice, opportunity, but also in the tragic conflict of brothers, in the struggle for power and conquest, in ruthless exploitation of minority groups, in the terrifying carnage of revolution. There is something beautiful in the epic quality of the people; there is terror in the blindness and power of an unrestrained folk. Throughout the world today, apparently in whatever transition we may be making to new stages of civilization, the mass man, the whole real people, approximate an accession to social power such as has not hitherto been recorded in the annals of men. Thus we come today to realize not only the historic significance of the people and their power, but in a day when the speed and sweep of technology has exceeded the capacity of even our most educated and widely experienced people, we face the problem of the great mass power of people, through communication, redistribution of wealth, clamoring for control, for reality, for quick readjustment, in a world which they little understand.

There are other realistic aspects of the situation. In a day when the world at large, and America in particular, has come to realize that its destiny depends upon the conservation of its great physical resources, we have come suddenly face to face with the realization that all this conservation and redistribution of the world's resources has meaning only in relation to the people. On the one hand we have found that the misuse and maldistribution of these resources have had their tragic results upon the people of the earth, upon the wealth of nations, upon national and international relationships; upon poverty of the people. If we use the analogy of soil erosion so freely predicated as the index of a nation's decay, we must also envisage the great erosion and waste of the people, an even surer index of how and when and why the people perish. But we must face also the other side of the problem in which it must be clear that there can be no permanent, enduring conservation and development of re-

sources except as the people are equipped and trained, motivated and conditioned, for such individual and cooperative effort and arrangements as will make possible permanent planning for the coordinate development of physical and human wealth.

There is here also in this new world of techniques and civilization a strange and powerful paradox; even as the machine gains power and control, even as science and technology dominate the world of man, even as lesser men through machines can do greater work, and lesser numbers produce greater wealth, so in the midst of this, and by its very token, man and the spirit of man become more important; the quest for spiritual expression and participation in the machine world becomes more insistent; and the people ever clamor for a larger and larger part and participation in a world which otherwise threatens to destroy them.

There is finally perhaps one other recapitulatory consideration indicative of this organic power of the people. It is illustrated in a recent statement made by President Roosevelt to the effect that those governments and government leaders who stray very far away from the life and reality of the people are not likely to survive. If we check up on the great historical civilizations, it seems quite possible that such a conclusion is justified. As best we can search out our facts from the opinions of the great historians, there have appeared certain consistent factors or forces which seem to contribute to disintegration and decay. These have been expansion, bigness, artificiality, and stratification on the one hand, and, on the other, a vast chasm of distance between the leaders and specialists and the people, together with the exploitation of these same people.

Manifestly, these considerations are of great importance to the South with its superabundance of virile and immature people, with its many challenging problems of standards of living and work, of occupation and migration, of education and equipment, of health and welfare. But in particular it is profitable to look at the size of the southern problem of developing the largest ratio of children and youth of any part of the country. For, the population of the Southeast tends to reproduce at a higher rate and has a larger ratio of children and young people than any other region. The ratio is much larger than for the nation as a whole and nearly twice as high as for a number of states. For instance, the average for all the southeastern states shows more than double the number of children under five years of age, with native white mothers per 1000 native white women 20–44 years, as for the state of California. California's 341 stands in stark contrast to North Carolina's 827. Connecticut's 371, Rhode Island's 363, New York's 362, and Massachusetts' 359 are more than doubled by Alabama's 786, South Carolina's 777, Mississippi's 740, and Arkansas' 798. Or to cite an index of net reproduction per generation in which 100 represents the trend toward a stationary population, all the southeastern states, except Florida, show an index of over 130 with four states over 150 as compared to all of the far western states, six of the northeastern states, and Illinois in the middle states, below the 100 index. So, too, with the exception of the Dakotas, Idaho, and West Virginia, no state outside of the southern regions

records as much as 40 per cent of its population under 19 years of age, and no southeastern state, except Florida, shows a ratio as low as 40 per cent. In contrast to the low states of California and Nevada with 30 and 31 per cent, are the Carolinas with 50 and 49.

These figures were taken for the whites in order to make nation-wide comparison of states. The negro superabundance of people and their reproductive capacity is approximately the same or a little more than the white groups which have the largest birth rate, so that the South thus has a double source of vigorous population needing all the vitality possible.

In contrast to this superabundance of children in the South is the extraordinary deficiency in standard food products essential to vitality and health. Thus, to take two only, milk and eggs, the deficiency is such that one could plausibly be led to believe that many of our low standards and inefficiencies might well be due to dietetic deficiencies as well as to hereditary or economic factors. The facts reveal the South with a low per capita milk production, and there are many areas in the Southeast where milk appears almost unobtainable to any reasonable extent. The estimated production of milk in the southeastern states in 1929 was 1,291,430,023 gallons. This is a deficit of 121 million gallons that should be met if the national, annual average per capita consumption obtained in this area. Or if the 90 gallons a year or the daily quart were produced, it would mean a shortage of a billion gallons. If to an estimate of the amount of milk needed, based upon recommended standards of living for health and vitality, should be added proportionate amounts of other dairy products, the deficiency would be still larger. It may be indicated further that the minimum dietary requirements of the Southeast cannot be set lower than 2,450,000,000 gallons of milk per annum. The states of Tennessee, Alabama, and Georgia, respectively, require at least 251,189,000, 254,040,000, and 279,217,000 gallons per annum. Their production deficits as of 1930 are: 1,161,455,187 gallons for the Southeast; 69,399,685 for Tennessee; 130,491,202 for Alabama; and 165,577,044 for Georgia.

Further illustration of needed food products in the region may be found in the production-requirement deficits for eggs in the southern states. Based upon a minimum dietary standard of ten eggs a week, these states average nearly 70 million dozen deficit as compared with their actual production record. Other large deficits are: Florida with 341 per cent; Georgia with 313; Louisiana with 302; North Carolina with 250; and Alabama with 232. It is interesting to note that the five states showing the largest production-requirement deficit in milk are the same as for eggs; namely, Georgia, the Carolinas, Louisiana, and Florida.

We may point out further food deficiencies by noting the Southeast's quota of the nation's major farm commodities: wheat, less than 2 per cent; corn, about 15 per cent; beef cattle, nearly 12 per cent; milk, about 12 per cent; butter, about 13 per cent; eggs, about 15 per cent; hay, not quite 8 per cent. The Southeast's ratio of vegetables, exclusive of potatoes, is cabbage, cantaloupes, and onions, nearly 10 per cent; white and sweet potatoes, nearly 23 per cent. The ratio of fruits: apples, peaches, and pears,

about 18 per cent; grapes and strawberries, about 5 per cent; oranges and grape fruit, about 43 per cent. The corresponding ratio of farm animals: sheep and lambs, about 4 per cent; horses and colts, nearly 9 per cent; mules and mule colts, 52 per cent; milk cows and heifers, nearly 16 per cent; all cattle and calves, 13 per cent; hogs and pigs, 15 per cent.

Set over against these is the Southeast's 85 per cent of all tobacco production; 60 per cent of cotton, yielding recently to the great Southwest's nearly 38 per cent. In contrast to this abundance of cotton and tobacco are the scarcity of special commodities necessary for health and vitality and for balancing the agricultural program of seasonal work, land conservation and enrichment, and seasonal stability. Thus, the production requirement deficit in eggs for the southeastern states shows an increase of from 90 per cent in Virginia to 374 per cent in South Carolina needed to meet reasonable standards. The other greatest deficits are found in the states listed below as requiring the following percentage of increase necessary for meeting the minimum dietary standards: Florida, 341; Georgia, 313; Louisiana, 302; North Carolina, 250.

The situation with reference to dairy products merits special treatment in view of not only the production-requirement deficits but also because of the relation to the whole program of balanced agriculture. Some of the deficiencies and problems have already been noted. The production requirement is met only in Kentucky with the other states requiring percentages of increase from 30 per cent for Tennessee to 403 for Florida. The other four low states are Louisiana, 224; South Carolina, 198; North Carolina, 139; Georgia, 130. The minimum dietary requirements for the whole Southeast may be set at 2,450,000,000 gallons, of which there is a production deficit of no less than 1,161,455,000 which is more than a tenth of the nation's total milk production. Thus the deficit must be made up at home.

Some explanation of this deficit will indicate also the practicability of reconstructing the whole dairy industry so that within as short a time as ten years the whole region can be remade. Thus, only 62 per cent of all farms in the Southeast reported cows milked and the average number of gallons per animal was only 394 as compared with 618 for the Northeast, 638 for the Far West, and 530 for the Middle States. So, too, the number of pure-bred cattle per farm is less than one per cent as compared with 28 per cent for the nation. Furthermore, the low ratio of pasture land, the excellent conditions for dairying and other factors make it clear that the problem presents no insurmountable obstacles, but requires special emphasis upon initiating, financing, and management. Yet the fact that one answer to the question often asked as to why millions of southern folk working on the richest land in the world are living on standards close to the margin of slow starvation and deterioration may be found in this deficit of dairy products, eggs, and vegetables, indicates the critical nature of this phase of southern agrarian life.

Returning now to our earlier theme of working for the development of both natural and human resources, it is clear how appropriately any programs which will increase the supply of vitamin foods

and balance agricultural production, must automatically contribute to the conservation and enrichment of our soils and of a diversified farming which will minimize our enslavement to cotton economy.

How the implementation of the above considerations would work may be illustrated with reference to the budgets of the poorer rural families and to the rebuilding of the poorer land of the South. Thus, the rural family illustrates the particular type of deficiency most pertinent to the present picture. Standard of living studies of southern rural families have shown that almost half of the total family budget goes for food. The proportion ranges from around 42 per cent for owner families to more than 55 per cent for tenant families. In regions of the country outside the South there is a natural tendency for more prosperous families to purchase a larger proportion of their food supply than poorer families who must follow more of a subsistence live-at-home routine. The tendency for poorer farm families to raise a larger part of their food has in the South been offset by the system of exclusive cash cropping and commissary feeding, so that families with very lowest cash incomes have been also the group raising least of the family food supply. A table including 52 samples of farm families shows ratios of food purchased in southern families ranging from only two to seven per cent in mountain areas, from 25 to 36 per cent for farm owners, and from 40 to 58 per cent for cropper families. This is in contrast to an itemized budget by the Bureau of Home Economics in the 1933 *Agricultural Yearbook* which states that about 83 per cent of the value of an adequate diet can be raised at home.

If we apply the remedy of diversified farming with a view to increasing milk supply, the following implications for developing natural resources are evident. In addition to the low production and consumption of milk, we note also the low evaluation of its livestock, the low evaluation of their products, and, on the other hand, the high ratio between cost of fertilizer and the depleted land and low farm crop returns per acre. And we also note, in those counties and parts of states showing large deficiencies in this respect, a correspondingly large burden of public relief services, and of other indices of inadequacy. But we also note great variation in different counties and states, with here and there not only a high degree of success but great increase within recent years, such as to indicate possibilities of immediate improvement through the proper use of technology.

The total number of pure-bred cattle in the southeastern states as reported in the most recent figures was 8,360,888, the lowest of any region. Calculated according to rural population this shows a per capita of 0.4 for each rural dweller. Two states, North and South Carolina, rank as low as 0.2. If we fix the optimum number as 1.5 per capita, the Southeast shows every state with a deficiency and the total with an aggregate deficiency of 18,540,216. Such a deficiency represents, of course, a value in millions of dollars for the cattle and more millions for their products. On the other hand, were this number or one-half of it added to the Southeast, there would be required, according to present estimated carrying capacity of grazing

lands in most of the southeastern states, four times the total number of acres now listed as total pasture lands. The present 45,000,000 acres would, therefore, be challenged to an improvement which would transform its ten acres' carrying capacity into that of two or three acres, together with the acquisition of another 40,000,000 acres taken over from the 170,000,000 acres in farm lands and from other lands not in use. Similar computations with reference to the amount of feed raised and consumed, or of hays grown and imported, would show equally radical transformations necessary before any such optimum estimates could be even suggested. Likewise, a new type of labor management and technique required for the care of high-grade cattle, for the construction of fences, for the improvement of lands, for the seeding of poor and rich lands for field and pasture, and for the curing and processing of hay and grains would constitute another difficult and important problem.

It is easy to see, therefore, why we attach so much significance to possible programs and influences which such a group as the American Dietetic Association might adopt. On the one hand, we picture the millions of physically fit children with their inherent possibilities and contrast them with the older picture of adolescence, in which many are undeveloped, undernourished, and without adequate opportunity for physical education and vocational development. Yet we have the almost unlimited possibilities of a great region which, through reconstructed agricultural programs, farm chemurgic activities, the implementation and education of great state, regional, and national agencies, may make one of the largest contributions to the national wealth and welfare of any region. In particular, we need fundamental research to explore the relation between diet and creative effort in the South, between diet and health and vitality, between deficiencies of agricultural production, wealth, and welfare. To make the picture more vivid, I think we may well assume that three or four generations of families under such economies as many of our southern farm tenant families now live, with low standards of diet and therefore low economic and physical resistance, with cultural complexes and limited educational opportunities, would tend to create a distinctive race of people, irrespective of any pure biological heritage. There would appear to be no greater field for major effort in research and planning. This becomes one of the major next steps, alongside the threefold and urgent, realistic task of educating for higher standards of living, of housing, of work, of appreciation for natural resources; of extending the framework of vocational opportunity for southern youth so that they may have opportunity and security for the future rather than marginality and migration; and, third, the actual training and development of these youth to be full-fledged workers and citizens capable of competition in any society.

NUTRITION AND SOIL CONSERVATION[1]

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"AS THE soil is, so are the people." These words are so well known as to be almost commonplace, and yet their full significance is only now dawning upon the American people. Scientists in the field of nutrition have long related human nutrition to the soil upon which plants are produced. Only last April at the proceedings of the annual conference of the Milbank Memorial Fund, Dr. Frank George Boudreau stated that nutrition is influenced, first of all, "by the soil and its conservation."

I will not discuss the technical aspects and physiological considerations of nutrition, for I am a layman and these matters must be left to those trained in the special sciences concerned with these fields; instead I shall detail what the Tennessee Valley Authority and the public agencies cooperating with it are doing to meet the present crisis of soil depletion and soil exhaustion.

During the World War the government of the United States invested almost one hundred million dollars in munitions plants at Muscle Shoals. From the close of the war until 1933 these plants had been lying there completely idle. Congress, in the statute creating the Tennessee Valley Authority, said that, in addition to many other duties, the TVA was to do something about putting those plants to work, but that they should be used in such a way so that they might again be used for war purposes if the need arose. Until such an emergency, TVA was to make use of the plants, experimentally or otherwise, for cheaper and better plant foods. This was a mandate to devote our energies to soil conservation and all that that implies in its widest sense.

The evolution of the national life of the United States has been more highly accelerated than that of other nations; yet, like them, there has been tragic disregard for the soil upon which the food of the world has been and will be produced.

This disregard of land has produced many of the economic and social problems with which we and other peoples are struggling. Every depression, or other catastrophe, deepens our concern for their solution. Deforestation and the removal of grass and other cover have been largely responsible for dust storms, soil erosion, low income, and many of the economic and social injustices existing in vast rural areas. These conditions, sooner or later, reflect upon our urban activities. Decreased purchasing power on the farm affects industry and labor, and a second low income group is formed which ends in depression and the consequent universal economic distress.

Plants fabricate elements into compounds essential to the life and maintenance of animals and human beings. The fact that nitrogen is an element of importance to the majority of lands of the nation might first suggest the use of the Muscle Shoals nitrogen munitions plant in peace time for soil rehabilitation; but, since nitrogen is an inex-

[1] Read before the Annual Meeting of the American Dietetic Association, Richmond, Virginia, October 18, 1937.

haustible element, twenty million tons above every square mile, and available to all civilizations, the board believed the equipment of the plant might be adjusted to experiment in the processing and conservation of exhaustible elements, the most important of which is phosphorus. That work is now under way, and it is my purpose to discuss the nature and significance of that program.

A people and its civilization are only as secure as the soil. An impoverished soil means an impoverished people; an impoverished soil means a low state of nutrition; and inadequate nutrition means an insecure, an unhappy and a weakened civilization. When we discuss the conservation of the life-giving elements in the soil and of the soil itself against loss and waste, we have hold of a seamless web, for when we touch any thread in the web we touch and affect the whole fabric of our community and individual lives. A deficient soil is a cause of low income, of a deficient nutrition, and of a deficient economic order. An inadequate nutrition in turn leads to further exhaustion of the soil, which in turn cumulatively means increased impairment of our human and natural resources.

What I have said is self-evident and generally known, and yet few of us in the intensity of our efforts in our particular posts of duty, realize the all-enveloping truth: "As the soil is, so are the people."

I am not writing generally about conservation of the soil, but about one essential mineral element of that soil known as phosphorus. Phosphorus may sound like a matter of limited interest, but this essential element of life in the soil, far from being prosaic or technical, is charged with drama. In that drama you and I and every other human being in the world are deeply and vitally concerned.

Phosphorus is one of the mineral elements to be found in the soil and through the soil in all living things, in plants and in human beings. Take away phosphorus entirely and life ceases on this globe. If the soil is deficient in phosphorus, our food supplies are immediately threatened. Without adequate phosphorus in the soil and hence in plant life, the life of animals and of human beings would rapidly deteriorate and would proceed on a halting and pitiful basis.

The dire consequence of deficiency of phosphorus in the soil is not an academic question, nor is it simply a wild imagining. The fact is that most of our land east of the Mississippi River is fast becoming deficient in phosphorus and unless that deficiency is met, unless the supply in the soil of these millions of acres is supplemented, the lands east of the Mississippi cannot long support agriculture. Without an adequate supply of phosphorus, grasses and sod cannot grow on our agricultural lands and that land is then helpless against the lashing of the billions of tons of rain which fall each year. There is virtually nothing to stand between this rainfall and the washing away of our top-soil into the rivers and sea.

The growing of plants takes out of the soil a certain amount of phosphorus. That phosphorus in some way must be replaced, and replaced in *adequate quantities*. Some of the vital elements such as potash lie deep in our soils or are readily available. But the replacement of phosphorus is another matter. Much of our phosphorus goes into the food we

eat and is not returned to the land except as we take specific measures to replace it. Now, where are the available phosphorus supplies for this life-preserving replacement? Virtually the only source of phosphorus for replenishment of the soil lies in the deposits of so-called phosphate rock. No nation which does not have access to large quantities of these deposits of phosphate rock can permanently endure. And consider this further fact in the world drama of phosphorus. The United States has within its borders more than one-third of the world's known supply of phosphate rock. Japan, Germany and Italy have limited supplies. The United States has been exporting about one-third of its production of phosphate rock mostly to three nations—Japan, Italy and Germany.

The importance of phosphorus and the importance of its utilization in the agricultural program is twofold. It is one thing to urge farmers to grow sod crops, which will absorb more water and reduce the washing away of soil by erosion; it is another thing to make it feasible for a farmer, who has to make a living all the while, to engage in that kind of farming. Congress recognized that it was not just a matter of congressional fiat, nor even a problem of education alone. They realized that the TVA Board must make it economical and feasible for the farmer to do that which would save the land from disastrous erosion. While public lands are large in extent, they obviously are small in relation to private lands. This phase of the program the board put into the hands of Dr. H. A. Morgan, chairman of the TVA, known widely for many years as a leader in this field, to see what use should be made of the Muscle Shoals plants in order to carry out these objectives most advantageously.

The first steps taken by the TVA were to take stock of the known elements of plant foods; to ascertain their adequacy and source for an all-time national need; and to consider the effect that a deficiency, either through exhaustion of supplies or through high prices, would have on the farm economy of the country.

When this had been accomplished the next objects of consideration logically were: (1) the prospects of success in reducing the cost of the deficient element or elements in the land; (2) the adaptability of the government plant at Muscle Shoals for this purpose; and (3) the production of new forms of plant food and the use of such plant foods on typical farms by practical farmers.

The needs of American agriculture had long been realized by the Department of Agriculture, by the land grant colleges, and by the farmers' organizations; a vast amount of research had been carried out and valuable results obtained. The gravest obstacle in the way of an effective land conservation program lay in the economic plight of the farmer himself, who had been practically forced by conditions he could not control to mine his soil of its life. Obliged to raise cash crops, increasingly on the single-crop basis, in order to pay taxes, interest on debts, and the cost of goods he could not produce, he was unable to buy enough fertilizer to return to the land the essential elements, such as phosphorus, that the plants took out. Nor could he afford, as a rule, the

expense of protecting his farm against leaching and erosion.

In the facilities available to it at Muscle Shoals, the TVA management realized that it had an opportunity, in cooperation with federal, state, and local agencies and voluntary organizations of farmers, to strike at one of the heaviest of the farmer's burdens—the cost of his plant foods. If the most essential of these foods could be put on his land, cheaply and in abundance, a long-projected program of soil recovery might be carried through. All of these cooperating groups agreed that the security and prosperity of our agriculture, and in fact of our civilization, depend upon giving our land the phosphate it requires and, concurrently, upon conserving the supply.

The obstacles in the way of increased use of phosphate on the land were formidable. For more than 80 years there had been no major change in the methods used in preparing commercial phosphate for agricultural use. The phosphate which had ordinarily been used as fertilizer contained a relatively small percentage of available plant food and a large amount of inert materials. Since cost of bags, handling, freight, and other charges form a considerable part of the cost of the phosphate to the farmer on the land, he has been unable to buy and use as much as the land needed, with the result that his soil has been gradually and critically depleted. Moreover, since phosphate is necessary to the successful growing of legumes, the farmer had been unable to secure his nitrates from the air in sufficient amounts by means of these nitrogen-fixing plants. He has thus in many instances found it necessary to purchase commercial fertilizers containing both phosphorus and nitrogen, and typically his crops have taken more of both of these elements out of the soil than he has been able to afford to put back.

Since 1934, TVA has been conducting at Muscle Shoals experiments in the production of higher concentrates of phosphatic plant food. Great quantities of such concentrates are needed to perpetuate agriculture in this country. A committee of the United States Department of Agriculture and the Association of Land Grant Colleges and Universities has said: "To the extent that an agricultural program for the maintenance of soil fertility at a high level is successful, the consumption of phosphate will increase until it will be several times this (the present) quantity." About nine-tenths of the agricultural areas of our nation are deficient in phosphate.

The report of this committee, I believe, is an extremely important document and summarizes in clear terms the crucial nature of the whole problem of phosphate supply and the relation of that problem to the human needs of this country and the world. In reporting on the importance of phosphorus in animal and human nutrition, the committee has this to say:

> Phosphorus, owing to its occurrence in bone, the soft tissues of the body, in milk, etc., is very important in animal physiology. Considerable work has been done on its metabolism within the dairy cow and other animals. Here the evidence is that, except in regions where the forage is exceptionally low in phosphorus due to the depletion of this element in the soil, ordinary rations of grain and roughage supply sufficient phosphorus to maintain

the general health, the production, and reproductive requirements of animals.

In many regions where the soil is low in phosphorus and the animals are fed largely on roughages and limited amounts of home-grown grains low in this element, phosphorus deficiency occurs. The animals show an abnormal tendency to chew bones and gnaw wood ("pica"); the appetite is poor, especially for roughage; the joints are stiff; and there is a generally poor physical condition. In more advanced cases of phosphorus deficiency the pica may disappear; and the animals, decidedly thin in flesh, become very inactive, moving about but little unless they are compelled to do so.

One of the most important characteristics of animals that are suffering from phosphorus deficiency is a very low content of inorganic phosphorus in the blood plasma. This is an important index of the severity of the disease.

Phosphorus deficiency with cattle is most prevalent in growing and in milking animals. In Minnesota, increases of milk yields of from 50 to 146 per cent were obtained when adequate amounts of phosphorus were added to the rations of animals suffering from deficiencies in this element; also, young animals that received the same amounts of digestible nutrients made better growth when they were fed adequate amounts of phosphorus.

Phosphorus deficiency has been noted with farm animals in various parts of Europe (Germany, Hungary, Belgium, France, and Norway), in South Africa ("lamsiekte", "styfsiekte"), Australia, New Zealand ("bush sickness") and other countries. In the United States symptoms of phosphorus deficiency or symptoms resembling phosphorus deficiency have been noted in parts of Minnesota, Wisconsin, Michigan, North Dakota, South Dakota, Montana, Texas ("creeps", "loin disease"), and in Florida, Alabama ("sweeny", "creeping sickness"), Colorado, Utah, Nevada, New Mexico and possibly in California. This deficiency has been especially studied in South Africa and Minnesota.

The problem of phosphorus deficiency can be met by feeding either (1) more grain, (2) grains richer in phosphorus, (3) more legumes, which usually are richer in phosphorus than are the common gramineous types of forage or (4) inorganic phosphate supplements, or (5) by a liberal application of phosphate fertilizers to the soil. The fact that the last method makes possible the growth of herbage that is rich in phosphorus and as phosphorus-rich herbage is generally richer in other nutrients, this will undoubtedly be the most economical way of dealing with the problem under usual farm conditions. Under range conditions, the feeding of phosphorus-rich supplements will probably be more practical.

Although less definite information is at hand regarding the phosphorus requirements of human beings, phosphorus is essential in human nutrition. In rickets, the blood plasma is low in inorganic phosphorus and it is difficult to produce true rickets when the calcium and phosphorus in the ration are properly balanced. Symptoms of phosphorus deficiency have been noted in humans on very restricted diets, as among Mohammedan women in Bombay and women and children in North China and elsewhere. However, it appears quite likely that the ordinarily approved feeding regimes in this country furnish adequate amounts of phosphorus.

In view of the importance of phosphorus as one of the basic elements necessary for human and animal life, the world supply and consumption are of deep significance. The best available figures indicate a total world supply

amounting to approximately 16,500,000,000 tons of phosphate rock; the United States possesses approximately 6,500,000,000 tons. The United States in 1935 produced 3,000,000 long tons of phosphate rock. This compares with 3,800,000 tons produced in Africa, 1,200,000 tons produced in Europe, 1,000,000 tons produced from island deposits, and 200,000 tons produced in Asia. Of the 3,000,000 tons produced in this country, approximately 1,100,000 tons were exported, or 36.3 per cent of the total marketed production. Prior to the World War nearly fifty per cent of the total domestic production in the United States was exported. In recent years exports have amounted to about 30 to 36 per cent of the production. Most of this, as I have said, was shipped to Japan, Italy, and Germany.

In its plant at Muscle Shoals, TVA has for several years been manufacturing a super-phosphate which contains about 43 per cent available plant food, and we expect soon to begin experimental production on calcium metaphosphate, a 60 to 65 per cent material. Other experimental materials are in various stages of investigation.

But mere research and experimental production are not enough. Actual demonstrations of these phosphate plant foods on farms and in a continuing program of farm management must be made in order that the benefits from the laboratories may find wide use. Therefore, the TVA, in close cooperation with the Department of Agriculture, the land grant colleges, and local and state officials, has undertaken, first with the seven valley states and later in states throughout the nation, a program the object of which is to help the farmer adapt his farm practices to the use of this phosphate plant food.

We have made a beginning, but heartening as the results have been, we all recognize that it is only the beginning of a long war. Every facility of the nation, of the states, of our educational institutions and of such professional organizations as the American Dietetic Association, must be marshaled to this huge task of saving our soil. A program, national in scope, is already under way under the general leadership of the Department of Agriculture and its cooperating agencies.

In closing may I commend for your consideration and approval the recommendations of the joint committee of the Department of Agriculture and the land grant colleges on this issue of our phosphate deficiencies. That notable report recommends:

> In the resident teaching courses in agricultural science the place of phosphorus in the maintenance of permanent agriculture, its importance to the health and security of the Nation, and the need of conservation of our phosphate resources should be stressed.
>
> Research should be directed especially toward the economic manufacture of phosphates, their use on different soil types, their effect upon soil-plant relationships, their effects upon animal nutrition and health, their place in the farm unit, and finally their ultimate relation to human health and security.
>
> Since our phosphate deposits are a major natural resource and since no effective soil conservation program is possible without adequate supplies of phosphorus, these deposits are essential for the future welfare of the whole Nation, and their exploitation and use should be most carefully safeguarded for both present and future generations.

Since more than one-half of the phosphate deposits in the United States are publicly owned, we recommend that the National Government adopt a policy for safeguarding these phosphate deposits for agricultural use in the interest of the public welfare.

The rehabilitation of our lands and the preservation of their life-giving fertility of phosphate are at stake. To such a peace-time crisis every American will respond in that spirit of love of country which has made our nation great.

THE SOCIAL SECURITY PROGRAM[1]

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APPRECIATION of the objectives of the social security program by members of the American Dietetic Association may be taken for granted. They are interested in the significance of a program which will afford to so large a group of people the security of at least the minimum necessities of an adequate diet. They can also recognize the danger in the popular tendency to regard the Social Security Board as guardian of a cure-all for the economic ills of the nation, just as the dietitian is considered the high priestess of a cult whose cure-all is the current diet—be it banana or spinach.

The dietitian's knowledge of the physical and economic incidence of protracted periods of diet under minimum standards which result in malnutrition, particularly with children, makes her a special partner with us in this program. Interpretation to the public of the findings of research in dietetics will furnish one of the soundest bases for understanding the ultimate values which we may anticipate as the social increment of the program which goes under the somewhat too inclusive title of "social security."

The Social Security Act is what is known in legislative parlance as an omnibus bill, or a bill covering a number of related, but separate, items. Clarification of its provisions will assure understanding in a discussion of its program and philosophy.

[1]Read before the Annual Meeting of the American Dietetic Association, Richmond, Virginia, October 18, 1937.

The act divides into three major programs; a series of grants-in-aid from the federal government to the states for state initiated and state administered programs; federal cooperation in state unemployment compensation programs; and a federally administered program of old-age insurance. Administration of the several titles of the act is assigned to certain bureaus of the Departments of Labor, Interior, and the Treasury, and to the Social Security Board. This last named is a new agency created by the act. It is a nonpartisan, three-man board, charged with responsibility for the administration of the titles of the act dealing with public assistance, unemployment compensation, and old-age insurance.

The first division of the program, grants-in-aid to the states, covers a wide but familiar field and employs a fiscal technique well established in our public financing. Federal aid is given for four general divisions of state activities:

1. Public assistance to the needy aged, to dependent children, and to the blind.
2. Public health: general public health activities, under which the campaign against venereal disease is now being carried on; maternal and infant health; and crippled children.
3. Child-welfare services (especially in rural areas).
4. Vocational rehabilitation.

Public assistance in some form is as old as communal life. The categories of those in need most universally accepted as community or governmental

responsibilities are: care of the aged, of dependent children, and of the handicapped. Tracing the history of state legislation on these subjects through our national history would be too laborious for our purposes here. Since colonial days we have progressed from local almshouses and outdoor relief to institutional care and to state old-age and widowed mothers' pensions, and on through the recent Federal Emergency Relief program to the present system of federal grants-in-aid to the states. The depression found us with state legislation which varied from some few fairly well financed plans for specific categories of assistance, to wide areas in which poor relief was still being given on very nearly the same plane as that established by colonial interpretation of the English poor laws.

The financial basis of state and local assistance programs was seriously disturbed by the depression period and in many areas broke down completely. It became evident that the costs of public welfare had grown beyond the financial capacity of state and local governments with their limited taxing powers. The dangers of this financial collapse were increased by certain factors which were becoming more important in our economic life—such as technological unemployment, change in the proportion of the age groups in the population, and the general effect of these changes on the family economy, particularly in the lower income levels.

Participation of the federal government gives financial stability and continuity to the state programs and establishes minimum standards of administration below which they may not fall. Under the public assistance programs, the federal government pays one-half of the grants for old-age assistance and aid to the blind up to a federal-state total of thirty dollars a month to an individual. In addition, grants are made for administrative expenses. The federal government also grants one-third of the total expenditures both for assistance and administration for aid to dependent children, not to exceed eighteen dollars a month for the first child and twelve dollars for each additional child. The amount of assistance given to the individual and the administrative procedure are established by the state. Federal participation is contingent upon approval by the Social Security Board of the state plan and the maintenance of certain standards of administration and financing.

Perhaps the change in terminology from "widowed mothers' pensions" to "aid to dependent children" illustrates our growth in social attitude toward public assistance. A few years ago we made aid to the needy child dependent upon many fine points of evaluation of the mother of the child. State laws required that she must be widowed by the death of her husband; she must be highly moral; and communities evinced a strong feeling that she must be clean and orderly and that her children must be caught in no act of childish folly. Today we can claim progress which indicates acceptance of the fact that children of not such perfect mothers can be needy and should be cared for by a governmental program designed for their aid and protection.

State acceptance of aid for dependent children has not made as rapid progress as aid for the needy aged in which forty-seven states, the District of Columbia,

Alaska, and Hawaii are participating. True, local public assistance plans without financial aid from federal funds may provide assistance to children in the ten states and one territory not participating in the program for aid to dependent children under the Social Security Act, and it is true also that many children profit from the increase in family income afforded by the grants to the needy aged.

Public welfare should be based on sound social planning in which the interests of all groups in the community are considered, and public funds are used to establish minimum community social and economic standards at that level at which the public interest is best served. Upon this premise it would be logical to give more attention to the needs of dependent children, for whom aid given at this time may mean, within a few years, adults able to maintain themselves and contribute to the economic stability of the state.

Studies of the changes in the population groups indicate that the ratio between productive and dependent groups is fairly constant, since the increase in the old-age group is compensated by a decrease in the number of children. From this fact it would follow logically that effort should be directed toward the highest possible degree of security and economic stability for children, since as adults they will face the financial responsibility of carrying the increasing burden of support of the dependent aged.

The benefits to the community from the program as a whole are worthy of serious consideration. It is imperative that we recognize the serious implications to the nation in the existence of large groups who live below the point at which the elementary necessities of life are available. There is also the definite value in terms of local community economics of the expenditure of these sums from the public assistance budget, from unemployment compensation, and from old-age insurance. Stabilization of purchasing power by release of these funds immediately into local purchases is a factor of no small importance. Dietitians, of course, are interested in the significance of such expenditures in terms of more adequate diets.

General acceptance of community responsibility for certain aspects of health as well as for subsistence may be assumed. Certainly dietitians are familiar with the growth of public health laws from the primitive taboos through religious-political controls, such as the Jewish dietary laws and similar codes, to the modern program to which they are making so important a contribution. Public health programs of the states were cut to a critical point during the depression, and this in the face of the increase in health problems and a growing appreciation of the possibilities of well-being which a more extensive health program can make possible.

The public health activities which are now being undertaken by the states in cooperation with the federal government under the Social Security Act are probably more familiar, to dietitians, than other parts of the social security program. It will be remembered that the program for maternal and child health starts with the problem of the health of the expectant mother. The foundations of a program of infant and preschool age care, which fills the most critical gap in

our public health system, have already been laid.

We may assume that community responsibility for relief in times of physical disaster is accompanied by a similar acceptance of the responsibility for action in times of economic disaster, and this brings us to unemployment compensation. Recurring periods of unemployment are phenomena which we have come, reluctantly, to accept as a part of our industrial system. The last depression found us unprepared and at first unwilling to admit more than a temporary need for neighborliness and assistance for a few unfortunates. However, the depression years saw a slow but definite facing of the realities of the situation, accompanied by a demand for a more permanent plan different from means-test relief.

The unemployment compensation program is a cooperative effort between the state and federal governments. A general federal tax on the pay-rolls of employers of eight or more in commerce and industry, against which an employer making contributions to a state unemployment compensation fund may charge off his state contribution as a partial offset, has encouraged the enactment of unemployment compensation laws in every state of the Union. A federal grant for the expense of proper administration of a state law establishes a basis of working cooperation between the two levels of government. The philosophy underlying this plan is that in times of prosperity we shall lay aside a reserve from which, in times of involuntary unemployment, compensation or benefits will be paid to workers in covered occupations over a limited period of time. Such payments are a cushion between periods of unemployment and reemployment, in order that the worker may face such recurrent layoffs with a certain degree of financial protection.

And, finally, there is old-age insurance—the one part of the social security program administered entirely by the federal government.

Here again, we face the realities of a situation in which the increase in the proportion of older persons in the population brings a change in the economic condition of the family group of the lower income levels. Coupled with this is the growing problem of industrial obsolescence or unemployable old age. With the advances in medical science which have increased the life span has come an unparalleled development in the invention and use of machinery, which in turn has not only displaced workers but has reduced the need for specialized skills, thus creating a new old-age economics. Federal old-age insurance is the long-term approach to this question of dependency, and through its provisions covered workers will be assured of at least some regular income after their productive years are over. The act establishes a system similar in some respects to retirement annuities.

The philosophy of the social security program is as old as our civilization, and the significant changes are in methods—changes which enable government to keep pace with modern demands upon it. To members of the American Dietetic Association with their knowledge of the economic and social maladjustments which begin in the physical and mental ravages of an insufficient and ill-planned diet, this program will

represent a constructive step in the progress toward a better ordering of our economic life. Because of their specialized knowledge in this field there is an opportunity for dietitians to make a profoundly important contribution to the thinking of their respective communities, and thus of the nation, in helping to establish the standards upon which the program is carried out and the techniques employed in its administration. Acceptance of the findings of scientific research in the field of dietetics will provide the answer to such questions as "adequacy of assistance". Such acceptance comes only when interpretation to laymen has followed the conclusions of the scientists.

The social security program does not bring a final answer to the problems with which it is concerned. Security in a dynamic society is not possible of achievement by "passing a law", nor is it to be attained by a formula. It calls for successive adjustment of controls and compensations within the economic system. This program is a constructive and orderly attempt to bring some social and financial planning into the development of governmental activities fundamental to the well-being and security of the American people.

POISONS IN FOOD—FANTASY OR FACT?

T. SWANN HARDING

FANATICS have been telling us for many years that our food supply is highly toxic. Even as long ago as 1757, there was such a food phobia furore in London that it impressed Dr. Tobias George Smollett. In his *Humphrey Clinker* he expatiates on the abominations of London life, in particular its poisonous food and water supply. In the same work, we find Mr. Matt Bramble writing Dr. Lewis a philippic against London life that makes us wonder how anyone survived. The drinking water, he said, was laden with sewage, drugs, minerals, and poisons "used in mechanics and manufacture" and was "enriched with the putrefying carcasses of beasts and men, and mixed with the scourings of washtubs, kennels and common sewers".

The wine was "vile, unpalatable, sophisticated, balderdashed with cyder, corn-spirit and juice of aloes". The bread was "a deleterious paste, mixed up with chalk, alum, and bone-ashes, insipid to the taste and destructive to the constitution". But the people preferred it to wholesome bread and sacrificed their health and lives to an "absurd gratification of the misjudging eye". Not only did they thus compel "bakers and millers to poison them", but the stuff was "so void of all taste, nourishment, and savour, that a man might dine as comfortably on a white fricassee of kid-skin gloves; or chip hats from Leghorn". The meats were discolored and the pot herbs were rendered green with brass, the poultry was rotten and the fish "would turn a Dutchman's stomach".

"The worst milk was thickened with the worst flour into a bad likeness of cream", the milk itself being "the produce of faded cabbage leaves and sour draff, lowered with hot water, frothed with bruised snails". It was carried openly through the streets and all manner of contamination fell in freely. "The tallowy, rancid mass, called butter, was manufactured with candle-grease and kitchen stuff", and the "fresh" eggs were imported from France or Scotland.

Yet all these enormities were quite unregulated, and the people of London somehow survived. Where did Smollett get his ideas? We find merely that he had been reading the exposé books of his day, for about that time a number of "scare" books had appeared. One notable example, written by an alarmist physician, bore the rather frightening title: *Poison Detected: Or Frightful Truths and Alarming to the British Metropolis. In a Treatise on Bread and the Abuses Practised in Making that Food, as Occasioning the Decrease and Degeneracy of the People; Destroying Infants; and Producing Innumerable Diseases.*

This was 1757. The author opened with profuse lamentations about poisoned food, tea full of copperas, wine purified with noxious drugs, veal whitened with chalk, beer "pernicated" with vitriol, and "our bread mixed with the most noxious and morbiferous matters". He then revealed the awful results of eating alum-bleached bread.

It was actually claimed that certain breads contained lime or chalk in proportions of 1 to 6; that the charnel

houses of the dead were raked for bone ash to adulterate these breads, and that London's population had declined one-half in recent years because of bread poisoning. This book did not stand alone. It had several successors, notably Dr. Joseph Manning's *The Nature of Bread, Honestly and Dishonestly Made.*

The bakers were accused of adding bean meal, chalk, whiting, slaked lime, "allum", and ashed bone to their bread—and there were other adulterants so terrible the horrified author refused even to name them! Various periodicals of the day reprinted portions of these charges and general hysteria began. A satirical reply to these diatribes convinced no one, though called *A Modest Apology in Defence of Bakers.*

Peter Markham, M.D., next published his *Syhoroc: or Considerations of the Ten Ingredients Used in the Adulteration of Flour and Bread.* In this, vague yet terrible charges were made and horrible adulterants indicated. It was followed by the publication of a reply which demanded the actual proof of specific charges against any baker. Proof, however, was not forthcoming. In fact, it was not to be had. But that did not stop the flood of books, Joseph Robertson's *Culinary Poisons, and the Adulteration of Bread and Flour* appearing in 1781.

Finally, the noted chemist, Dr. Frederick Accum, was convinced and rehashed the charges of food poisoning and adulteration in his treatise on culinary poisons. This book was almost immediately pirated in an anonymous and sensational work, forbiddingly entitled *Death in the Pot.*

By this time people were saying that the bread of London contained gypsum, whiting, slaked lime, chalk, finely powdered granite, pipe clay from Cornwall, garden pea flour, horse beans, potatoes, bone ash, alum, spirits of vitriol, ammonia, magnesia, and other adulterants too dreadful to mention. Finally came Henry Jackson's crushing and final reply, *An Essay on Bread.*

In this sensible and unbiased book Jackson reported his thorough investigation of the charges. He actually analyzed London bread and the bakers were entirely vindicated in that none of the adulterants, save alum in small quantity, proved to be present, while saleable bread could not even be made containing the adulterants in the quantities mentioned.

Jackson analyzed the bread of over 100 London bakers and tried to make loaves of adulterated bread himself. He found that the faults cited merely indicated inferior flour, poor baking technique, insufficient or improper fermentation and the like. In short, the populace of London had permitted itself to become unduly excited.

Why a man of Dr. Accum's distinction should have permitted himself to further this propaganda is as difficult to understand as it is to explain why so many apparently intelligent and educated people make false charges regarding our food supply of today. Certainly modern food processing, however imperfect it may be in some ways, avoids the gross and disgusting contaminations of a century ago.

Fanatics, however, are not impressed by facts. Instead they revel in vague rumors and unsubstantiated reports. Even today they still insist that we are being slowly poisoned by the food we eat. They tell us that dangerous poison

sprays containing arsenic and lead, preservatives like sulfur dioxide and sodium benzoate, mineral yeast foods such as potassium bromate, bleached flour and so forth, menace our very existence.

The world contains many things that are dangerous to human beings, including automobiles, electricity, fire and water, but man must learn to survive in his accustomed environment by the use of sound judgment. Powerful drugs and poisons, dangerous unless carefully used, must be accessible for certain purposes.

But to inform the public that white bread, smoked ham, bran, vegetable-fat shortening, and all fresh fruits and vegetables subject to spraying, are harmfully toxic, or that all "dangerous" drugs should bear a poison warning, is both scientifically absurd and actually unwarranted. We should merely have added confusion by using poison labels indiscriminately, for even sugar and common salt may in a sense be poison.

Sulfur dioxide is used to prevent the darkening of fresh fruit after cutting, and the development of a leathery texture during drying. Sodium benzoate is used to preserve certain edible products made from sound fruits and vegetables. Unprejudiced toxicologists generally agree that the chemicals as ordinarily used in foods do not constitute a health menace.

Sulfur dioxide does not long remain on the fruit as such. It rapidly changes to harmless sulphates and is largely dissipated thereafter during the cooking process. It would take a great deal more of these preservatives than are found normally in our food, to harm human beings. Too much sulfur dioxide is in itself a limiting factor as in excess it readily renders fruit inedible.

When it comes to bleached flour, we face at worst a foolish custom, not in itself harmful to health. Smollett complained that in his day the millers and bakers bleached flour and baked goods by adding poisons, and that they did so because of consumer demand. Therefore, he concluded, the millers and the bakers poisoned the silly public at its own stupid request. The bleached flour of today does not offer a health menace. The small residium of chemicals left therein—nitrate radicals or benzoic acid —can, according to toxicologists, do no harm.

The bromine menace in bread is also nil. Yeast is grown upon a medium that contains certain minerals, among them potassium bromate. When added to bread the yeast inevitably carries along a little bromine. But tests made ten years ago and still valid showed that many common foods, ordinarily used without harm, naturally and regularly contain from two to ten times as much bromine as bread made with this yeast. As a matter of fact, bread made without the yeast grown on potassium bromate contains about as much bromine as bread made with it. The menace is as much a fiction as that concerning aluminum cooking utensils.

The tremendous quantities of arsenic and lead used to protect growing crops of fresh fruits and vegetables do constitute a menace. In recent years, entomologists have taught the growers to make these sprays adhere by the use of added adhesives. The fruits and vegetables are protected, but often lead or arsenic is present in dangerous amounts from which, however, federal and state

food officials are eager to protect us. They try to afford this protection without bankrupting the growers and without prohibiting the marketing of fresh fruits and vegetables which would, of course, constitute a real health menace.

The United States Food and Drug Administration has for several years actually devoted one-third of the funds available for the enforcement of the Food and Drugs Act, to safeguarding the public health against spray-residue poisoning. The act specifically prohibits the interstate shipment of foods containing *added* poisonous or other deleterious ingredients which *may* render them injurious to health. Note the words in italics. Poisons *naturally* present in foods are not prohibited by the Wiley Act. Furthermore, there are no legal food standards under the Wiley Act which make certain definite amounts of added poison illegal; each case stands on its own merits and it must be shown today that the food may be injurious to health as ordinarily consumed.

The Supreme Court has construed this provision strictly, saying that food may be consumed by "the strong and the weak, the old and the young, the well and the sick", and if it "because of any added poisonous or other deleterious ingredient, may possibly injure the health of any of these, it shall come within the ban of the statute".

But this must always be remembered: even the most deadly poisons may readily be diluted so that they are not toxic at all. To get the last trace of a "poison" out of a food is not only prohibitively expensive but unnecessary. There are limits to the poison menace.

In 1927 the government called a conference of leading poison experts to pass upon the quantities of added arsenic and lead that might possibly render foods unsafe. The toxicologists generally agreed that 0.01 grain of arsenious oxide or 0.018 grain of lead per pound of food could not possibly menace the health of anyone. Those tolerances were broadly accepted by the government for its guidancee. In other terms, it means that there shall not be more than 1.43 parts of arsenic or 2.57 parts of lead per 1,000,000 parts of food, and that is very little.

Certain new organic insecticides are gradually replacing poison metals in insect sprays for some uses, but lead arsenate must still be used to protect apples and pears. However, the commercial cleaning of such fruit, by washing it in dilute hydrochloric (muriatic) acid, has become practically universal and is so perfected that our intake of poison is at the vanishing point from this source.

With continued federal and state vigilance, such dangers to health are greatly minimized. If consumers wish to make doubly sure, however, they may cut out the natural poison "cups" of the fruit at the stem and blossom ends and discard these as well as the peel.

The government does not tolerate any amount of arsenic or lead, no matter how small, when there is no excuse for its existence. Aside from lead and arsenic sprays, the contamination of the American diet with these poisons is practically nonexistent. The "safe limits" of both lead and arsenic are less than 1/40,000 of an ounce per pound of food. Such small amounts of lead are, however, difficult to determine. Until recent years the method of determination was so complex and so slow that it

was difficult to keep up with the incoming samples. Now, however, new, rapid, and accurate methods for the determination of lead in foods have been perfected and protection is greatly improved.

Just to make sure, the Food and Drug Administration has analyzed 1200 foods of all different classes and localities for arsenic, and 2000 for lead. Special emphasis was placed upon foods such as milk, candy, chocolate products, and jams, which are consumed extensively by children, and in no case was anything alarming discovered.

No such quantities of lead or arsenic were found in fluid or evaporated milk as could, by any stretch of the imagination, be described as harmful. On a fluid basis the lead averaged about 1/50 of the amount regarded as possibly harmful and the arsenic about 1/20 even in the samples containing the greatest amount of the substance.

In common with many foods in their natural state, both cow's and human milk contained lead to the extent of about 1/100 of the tolerance established by toxicologists. Only two or three out of several hundred samples of jam contained lead beyond the limits of safety, and prompt corrective legal action, in these instances, was taken. As in sardines, at times the trouble was traced to a certain type of lead container that was eliminated.

Out of 100 samples of cocoa and chocolate confectionery, only two factories put out a product containing much lead. Cocoa was implicated in both instances, and the accidental and sporadic incorporation of tiny lead seals used to close the sacks of cocoa nibs where grown, proved to be the cause. Significant amounts of lead were found in some teas packed in lead foil, and this hazard was also eliminated. The danger of lead in all chocolate products, never important, has been reduced by the manufacturers to a vanishing point, as a result of these investigations. As for arsenic, there is yet to be found any hazard whatever in our current food supply, other than that traceable to extraneous arsenic from spray residues.

To many people, however, and to all fanatics on the subject, poison is poison, and no matter how small in amount, it menaces health. It is difficult to determine the precise lethal dose of a poison, either for mice or men. Poison has never been defined in medical jurisprudence, either here or in Great Britain, and all attempts at definition end in bewilderment.

We are mobile pharmacies. Poisons as deadly as any with which primitive savages tipped their arrows can be extracted from our own bodies. Insulin is absolutely essential to us, yet in very slight excess it can cause violent convulsions and death, depending upon the person, his state of nutrition, and the production of his own insulin factory within the pancreas. When the parathyroid glands produce too much of their chemical or hormone, calcium is so rapidly removed from the bones that they can no longer bear the body's weight. Epinephrin, manufactured by the adrenal glands, is a powerful poison, yet we must have some of it. Vitamin D can produce toxic symptoms when used to excess. Yet all these are necessary to our existence.

What is "healthy" and what is "poisonous"? Certainly, pat definitions of a poison are impossible since much depends upon cumulative toxic effects, the state of the person taking the poison, and to what extent the poison is diluted.

EDITORIAL

"Buckwheat Cakes and Indian Batter"[1]

[*Editor's Note.*—The South's peaceful, unhurried charm, its philosophy and serenity of life, and its love of the land and the fullness thereof, can best be portrayed in the humor and pathos and liquid beauty of the following words by one of the South's favorite sons, Mr. John Temple Graves:]

I take my text from a song of the South which has become a nation's song—from those lines in "Dixie" where reference is had to "buckwheat cakes and Injun batter", where dietetic note is taken of the fact that they will "make you fat and a little bit fatter", and where the prescription is to "look away, Dixie land!" I speak not as a professional Southerner, although we have many of them here, nor as a professional anti-Southerner, and we have as many of those, but as one who loves his part of the country and who believes that with all its faults it has some things worth saving and contributing, some things that are good for the digestion.

. . . . there are things in the South—in the tradition if not the present scene—that are good for the digestion. Psychological things. There is the tradition of serenity, for example. We have the tradition even though we have less and less of the serenity. In my own Alabama some of our go-getters, our up-to-the-minutemen of business, our supercharged chamber of commerce live wires, are mortally embarrassed by the fact that our state motto is "Here We Rest". They spend a great deal of time explaining to prospects that when the chieftain of a wandering tribe came first to Alabama and thrust his spear into the soil and cried "Here We Rest" he didn't mean what he seemed to mean. He didn't mean really rest. He meant "Here we stop and make our home. This shall be our abiding place. It is a goodly land. We have found no better. Here we rest!" . . . Rest in those serenities for which the South still stands in national sight and for legend of which it is loved. We know, because we suffer from it, that there is a serenity which is mere stupor, a serenity that goes to sleep, that is a compound of hookworm, malaria and plain ordinary laziness. But we know that there is another serenity which is the secret of life and of digestion, the answer to all the haste and hysteria, the nerves and insanities, of this aspirin and amytal age. Here we rest! If my Alabamians can't appreciate their motto I hope other states will steal it. Here we rest enough between the businesses of making a living, let them say, to cultivate and enjoy the deep arts of life. Here we rest enough to sense and absorb the moments, the hours, the days as they pass, for they pass but once. Here we are not so foolishly absorbed in the saving of time and money that we have no imagination left, nor any digestion either, for good use of the time and money we save. Here we labor with all our might, and when labor is done, here we converse, and play, and dream, and smile, and remember—and make an occasion of our meals. Here we anticipate with our

[1] An address by Mr. John Temple Graves II, editor, author, economist, at the annual dinner of the American Dietetic Association, Richmond, October 20, 1937.

arts of leisure what the machine age has promised of leisure and must give one day if it is to fulfill its promise. Here we work hard, and, after work, here we rest!

It is an old southern custom, and it is good for the digestion. There are others, equally good. There is a thing called romance. Not the romance of a boy and girl in the moonlight (although that is very beautiful and very biological) but romance in the wider sense of gallant adventure, of élan in living, of texture and brave color in the garment of our days. They say romance is dead, that the machine age killed it and the depression buried it, dead even in the South where it is supposed to have been born and bred, that even Southerners think no longer in terms of moonlight and magnolias, muscadines, mammies and mint juleps. The days of swords and roses, they say, are gone. The swords have given way to spindles and sewing machines and kilowatt hours, the roses have given place to rheostats and rotary engines and Rotarians. But it all depends on your point of view. Romance and reality are not opposites. Romance is a way of looking at a thing, of dealing with a thing, and when the thing looked at or dealt with is a real thing, the man who can approach it in this spirit of romance is thrice armed for dealing with it. It is one of the greatest driving forces in life, and never so necessary as now, when science is offering life so much. Science is coming to the masses now, educational science, mechanical, psychological, dietetic science. But science's voice is cold, and we are a people upon whom the sun has shone. Unless science is brought to us in interpretations that hold some fire of gospel, some thunder of prophecy, something of lamplight's simplicity, some of the serenity and homeliness of knitting needles, some gestures of romance—we may miss the full import of its great voice. If romance is what they say it is, if it is a matter of love and struggle and faith, of magic vistas and heroic dreams, of giant undertakings, there's plenty of romance all around us, in the problems and promises and routines of our modern day. There's romance, for example, in the new love we have for our land, our soil, and the new resolves to save it from the winds that blow it away, the waters that wash it away, the unscientific and careless agriculture that eats it away. There's romance in the great watch we've set ourselves beside our rivers, those rivers that run so yellow and red with America's soils. We hold the rivers before us like test-tubes, great test-tubes where progress or lack of progress in the work of soil preservation will show. We resolve to rid them of their tell-tale yellow, take them out of the red, restore to them the transparency that is said to have been theirs in other days before we stripped the hills of trees, the plains of grass, and let our precious soil, our sweet land, run to sea.

There's romance in the faith with which our social scientists and economists are facing the share-cropper and farm tenant problem of America, in their belief that education and social aids can improve both the man and the land and lift this most basic of all problems from our national back. There's romance in the long struggle of our negro population up from slavery, physical slavery and then economic slavery....

There's romance in water power. Whether you are for public ownership or private, there is romance in these giant

undertakings along the lips of America's rivers and streams, where men have chained the lightnings that live in falling waters and turned them to vast electric enterprise; there's romance in the billions of invisible horse-power that are bringing new facilities, new conveniences, new contacts and processes to all the cross-roads of our land.

There's romance in modern chemistry, in the magic vistas in agricultural and industrial chemistry that are being opened to America's sight, in the employment of new or forgotten or neglected resources to father a whole brood of by-products and new processes even unto the third and fourth generation. . . .

Yes, there's plenty of romance left today for those with the eye to see it and the heart to hold it. Plenty of swords and roses for those who can love a sword for its blade and not its mere scabbard, who can love a rose for its flame and not its mere name. And it's good for the digestion.

Serenity and romance. They may be as lost to the South now as to the rest of the country but they can be recovered. They can be put upon our national menu as easily as buckwheat cakes and Indian batter can, and with far more of gastronomic felicity. The Bible tells us that man must earn his bread by the sweat of his brow, or, to be exact, "in the sweat of thy face shalt thou eat bread." That is good economics and good religion, perhaps, but if taken literally it is very poor dietetics. If the heart is where romance beats and serenity takes source, if the larynx of the throat is where laughter and love reside, if the eye is where vision and imagination and enthusiasm live, then it seems to me that without any impiety at all we may read between the lines of Holy Writ and say this—that man shall earn his bread and eat it not merely in the sweat of his brow but also in the beat of his heart, in the lift of his larynx and in the light of his eye. It is good for the digestion.

Spinach: to Eat or Not to Eat

Recently the "spinach eaters", including Pop-Eye, have had little encouragement from the biochemists. But all controversial matters have two sides and the spinach eaters have been patiently waiting for someone to prove scientifically that all the spinach which has been willingly or unwillingly eaten for generations, has not been just so much poison. Fortunately for the spinach addicts, Macy and co-workers[1] at the Research Laboratory of the Children's Fund of Michigan and the Children's Village in Detroit have now fired an effective broadside from the lines of the spinach eaters.

These investigators state: "The majority of investigations on the nutritive value of spinach have usually been for a different purpose than a study of its deleterious properties in average servings and have included enormous quantities of spinach which are all out of proportion to actual dietetic practice." Yet the "spinach haters" would admit that even in the study of Macy and co-workers, considerable spinach was fed: 100 gm. daily over periods of from 15 to 40 consecutive days!

The first onslaught against spinach seems to have been made by Sherman

[1] Bonner, P., Hummel, F. C., Bates, M. F., Horton, J., Hunscher, H. A., and Macy, I. G.: The influence of a daily serving of spinach or its equivalent in oxalic acid upon the mineral utilization of children, J. Pediat. 12: 194, 1938.

and Hawley[2] in 1922 when they found that calcium from spinach, carrots or celery was not so well utilized as the calcium from milk when fed to pre-adolescent children. In their study, the oxalic acid content of spinach was not considered as an influencing factor. Since then it has been determined that the oxalic acid present in foods[3] is not toxic in the amounts ordinarily consumed but that it does combine with calcium of the food to form insoluble calcium oxalate, which cannot be absorbed. Furthermore, oxalic acid is a normal constituent of practically all vegetables and fruits and it is also a normal product in the animal body. The possibility of too much oxalic acid in food becomes pertinent only when the diet does not have sufficient calcium to unite with the oxalic acid, with enough remaining to supply the body needs. According to Macy and her co-workers, "The calcium intake of eight of the children [between five and seven years old] approximated 0.8 gm. daily while that of the two eight-year-olds was 1.3 gm. The oxalic acid content of the 100 gm. of spinach fed amounted to 0.7 gm. The calcium contributed by the spinach supplement represented only 5 to 7 per cent of the total intake. Since the free oxalic acid of the spinach will combine with the calcium of the other foods eaten simultaneously, any untoward effect on calcium retention will depend upon the quantity of spinach consumed and the adequacy of the calcium in the diet."

Macy and her associates have shown repeatedly that metabolism studies on minerals must cover adequate test periods; due to the practical difficulties involved, this has not been done in much of the work reported from other laboratories or hospitals. Many correlated mineral metabolism studies at the Children's Fund Research Laboratory under Macy's direction have been carried on over many years and on a large number of individuals. In the study referred to above, 121 five-day metabolic balances, including nitrogen, calcium and phosphorus, have been made on ten growing children. One eight-year-old boy was observed for 85 consecutive days, during 40 of which he received daily 100 gm. of spinach followed by 5 days with an equivalent amount of oxalic acid and calcium substituted for the spinach. During the first period of 25 days and the final 15-day period, he received the control diet. Each child, therefore, served as his own control.

The spinach was superimposed upon a diet made up of simply prepared common foods which had promoted good growth and storage in these same children for several months. Other investigators have observed the availability of calcium in spinach as compared with that in milk, over shorter periods of time.

Of considerable interest but too long to comment upon here is a paragraph by the same authors under the heading "Cumulative Storage", in which are pointed out the gradual metabolic adjustments which may be made upon a change in dietary regimen and that "average daily balance data may mask

[2] Sherman, H. C. and Hawley, E.: Calcium and phosphorus metabolism in childhood, J. Biol. Chem. 53: 375, 1922.

[3] Kohman E. F.: Organic acids and the acid-base relationship: Oxalic acid in foods, J. Am. Dietet. A., 10: 100, 1934.

the alterations in rate of storage of an element".

In their summary, these investigators state that the storage rates for nitrogen, calcium and phosphorus, as established by the control periods, were not significantly altered by the daily consumption of 100 gm. of spinach. Moreover, they were compatible with normal variations observed in growth.

The supplementation of an already adequate diet with a generous serving of spinach daily, even for as long as 40 consecutive days, did not change the rate of calcium storage in growing children when their calcium intake was adequate to cover the precipitating effect of the oxalic acid and provide for their fluctuating growth needs.

The practical conclusion drawn from the data as recorded is that spinach is not harmful even in servings of 100 gm. daily, at least in pre-adolescent children, but because of its richness in vitamins, minerals (especially iron) and other nutritive essentials it should retain its customary place along with other green leafy vegetables.

So, more power to Pop-Eye. We shall cheerfully keep on eating spinach as we have been doing right through this spinach war.

CURRENT COMMENT

Nutrition Work in China

If the lower economic groups of China's 450,000,000 people might have their appetites for food satisfied and those of the privileged groups might learn and practice the principles of good nutrition, in two generations this improved internal environment no doubt would result in an increased resistance to disease, greater physical endurance, longer life span, and perhaps a changed philosophy. Might not this step toward positive health on a nation-wide basis have its effect in a greater capacity to cope with the nation's problems and finally result in China taking her rightful place among nations?

The solution of the problem of increased quantity and quality of foodstuffs, their preservation and transportation, and finally their intelligent use, requires the joint forces of the civil engineer, the agricultural expert and the nutrition worker. A well-balanced and abundant diet is fully as important to health as shelter, clothing, cleanliness, or protection from communicable disease, yet in China the application of the science of nutrition trails far behind the application of other sciences that pertain to positive health.

Through necessity, the Chinese of the lower economic groups are almost exclusively vegetarians. The country is overpopulated and the food producing power of the land is limited, the soil is depleted, floods and droughts are frequent. To convert plant food to animal food is expensive so the people must depend on cereals, legumes and nuts for protein. Only the more privileged may have in their diet the limited amount of animal food produced. Dairy products are practically unknown. Eggs have a high sales value and are an important item of export trade so are not generally available to the masses of the people.

The diet of the lowest economic group in North China is essentially of *wo tou* and salted turnip, with boiled *pai tsai*

or Chinese cabbage, or other vegetable on rare occasions. *Wo tou* is a cake made of corn flour and soy-bean flour or ground millet, baked on a griddle. The seeming vigor of people on this diet indicates adaptation to a limited diet acquired through countless generations. The somewhat higher economic groups have as their staple food, polished rice and *man tou* or steamed bread made of milled wheat flour. This group scorns the cheaper and more nutritious whole grain cereals, the use of which would enable them to purchase more vegetables and fat. A still higher economic group may have pork or eggs occasionally. This with *tou fu* or soy-bean curd allows a fair amount of protein. This group also has rice and *man tou* as its staple food but uses generous amounts of vegetables, some fruits and whole grain cereals. The fats used are sesame oil and lard. Nuts and seeds, soy-bean sauces, vinegar, and salted vegetables are included in the diets of this group.

Besides the lack of protein of good biological quality, all studies show diets in North China to be low in calcium and in vitamins A and B. The almost perpetual sunshine makes vitamin D in the diet of minor importance. Rickets in pronounced form is seldom seen. Scurvy and beriberi are almost unknown. The occurrence of nutritional edema, tetany, and keratomalacia is common. Ill-defined states of malnutrition are very frequent and are manifested in diseases of lowered resistance such as trachoma and tuberculosis.

Nutrition work in China for the most part has been confined to the laboratory and to the pages of the scientific journals. The Chinese are becoming aware that theory is not enough. They are becoming aware of the necessity of the more difficult task of applying the science of nutrition. The educational institutions are calling for teachers of foods and nutrition. Nurses' training schools are calling for better trained teachers of dietetics and nutrition. Since dietetics has become so much a part of the practice of medicine the Chinese practitioner of modern medicine is now asking for the assistance of the dietitian in the care of the patient. More and more emphasis is being placed on the development of public health medicine. Such a program will promote a demand for the public health nutritionist. The calls of all these groups are for the most part unanswered. Yet the few Chinese women who have studied nutrition and dietetics have proved to be adapted to this field of work and find it a satisfactory means of self expression.

Yenching University at Peiping is the only institution of higher learning in China offering a course in home economics which leads to a degree. Service courses are offered in Ginling College, Hwa Nan College and West China Union University. Graduates from the department at Yenching each year range in number from none to twelve. The course should develop into an excellent department. The serious handicaps are the lack of native talent to form a strong faculty and the lack of funds to bring such talent from the West for adequate periods of time. There is much to be said in favor of giving the Chinese young woman her undergraduate training in home economics in the natural environment of her own country rather than in a western school where she becomes accustomed to a standard of living which she cannot hope to reproduce in China. The number of young women attracted to the study of home economics is in

direct ratio to the strength of the course and to the amount of assurance that the work will lead to a satisfactory career.

In February 1934, a course in hospital dietetics was first offered at Peiping Union Medical College based on the course approved by the American Dietetic Association, modified to suit the needs of the community and to bridge the gaps in the academic training of the student. The main purposes of the course were to train dietitians to fill the sadly depleted ranks of the dietary staff in that hospital and finally to develop a staff that might carry the responsibility without foreign assistance. Twelve students have completed the course. Of these, two were college graduates with chemistry majors, three were Peiping Union Medical College student nurses who elected hospital dietetics for special study, and seven were graduates from the Home Economics Department of Yenching University. The last named group have been the best students of the subject and have gone into the more serious aspects of its application.

Until dietitians are universally included in hospital staffs in China, the nurse must be taught to concern herself seriously with the dietary care of the patient. With this responsibility in mind every care is taken to make the course in dietetics and nutrition for student nurses at Peiping Union Medical College a practical and inspiring one. An effort is made to correlate the course with the foods, the economic conditions, and the customs of the community.

Similar courses, simplified to suit students academically less well prepared, and taught in the Chinese language, are offered to postgraduate groups.

The oft repeated question, "If you cannot send us a dietitian will you take one of our graduate nurses and give her the training she needs to handle our food problem?" has been the plea from mission hospitals which resulted in the organization of a four months' course in hospital dietetics given in Chinese. The course was given from February to June 1936 and repeated in 1937. The classes were limited to four students who were required to be members of the Nurses' Association of China, to have two years' experience and a working knowledge of decimals and fractions. This is a particularly difficult course to teach but results to date indicate that it may be a useful stepping-stone to better hospital food management, better kitchen housekeeping, and more scientific management of diets.

That the thinking Chinese wish instruction in nutrition is indicated by the calls which come to the few trained people—requests for radio talks, talks in public schools, food demonstrations to mothers, and instruction in teachers' training schools. In present day, war-torn China, all scientific work is more or less at a standstill but it is easily predictable that with peace will come a new impetus to scientific undertaking. Then it is to be hoped nutrition will take its proper place in the advancement of the welfare of the Chinese people.—ESTELLE NESBITT, *Chief Dietitian, 1933–1937, Peiping Union Medical College, Peiping, China.*

PERUVIAN FOOD CUSTOMS[1]

Peru, that small but very wealthy country of South America, lies south of the equator just on the edge of the

[1] Presented before the Diet Therapy Conference, Diet Therapy Section, American Dietetic Association, Richmond, Virginia, October 19, 1938.

tropical zone. Altitudes in the country range from sea level to over 18,000 feet. For this reason it is easy to see that there is a variety of climates at one time. On entering the harbor of Callao, the chief port and main approach to the capital of the country, you see on one hand the Island of San Lorenzo, a naval and submarine station, and in the opposite direction the Green Rimac Valley. The distant hills and the towers of Lima churches make a pleasing sight. Lima, once the capital of Spanish South America, owes its creation to Pizarro the Conquerer, some 400 years ago. As Prescott says: "Amidst the war and destruction which Pizarro and his followers brought on the devoted land of the Incas, Lima, a beautiful city of the Kings, serves as the most glorious work of his creation, the fairest gem on the shore of the Pacific." Callao, the seaport city, is eight miles distant, and is connected with Lima by train, road and electric tram.

Located between these two historic cities is the British-American Hospital where I have been able to observe and learn the Peruvian food customs for the past three years. Since the present civilization of Lima is a blend of all nationalities, I have also had an opportunity of attempting to satisfy the food tastes of people from all parts of the world. For breakfast, Americans, of course, look for their American coffee, while the English call for tea, but neither of these would prove satisfactory for the Peruvians. They must have their *café con leche*, or hot milk and coffee essence. When speaking of Peruvian food customs, one thinks of the hours at which meals are served. The wealthy Peruvian lady has *café con leche* and a hard roll served in bed at the hour at which she awakens, possibly 7:30, but she does not allow this to satisfy her after she arises, for she then partakes of more *café con leche*, ham and eggs, toast or hot rolls and the inevitable *postra*, which is a fruit dessert and may be served raw or cooked. Approximately at 1:30 the Peruvians begin their lunch hour.

Peruvian soups are most interesting. One of the most famous national dishes is the *chupe*, a stock soup to which has been added a liberal amount of potatoes, onions, tomatoes, ears of corn finely cut, and at the last moment before serving, whole shrimp and milk. Additions may be made according to the cook who prepares it. This is always eaten with a liberal amount of dried bread which accompanies all courses.

Probably the second course will be an omelet with vegetables, then comes a very famous dish, *pato con arroz*, consisting of duck and rice, peas, onions, and a liberal amount of fresh red pepper. With this course will be served huge portions of mashed potatoes and spinach puréed. It is interesting to note that the Peruvians will not eat green spinach *en branche*, as we like it; this they call hay. If the family is particularly hungry, you will probably also find vegetable salads of tomatoes, lettuce, celery, cabbage or beets on the menu, though in the hospital we never served the raw vegetables which are grown in that part of the country because of the danger of bacterial contamination and attendant exposure to tropical diseases. For dessert, strawberries and cream will probably be served if they are in season, a watery ice cream, or perhaps a heavily

frosted cake, too rich to appeal to an American palate.

After luncheon, the Peruvians take their siesta, seemingly only to rest in preparation for their next meal which is served at any hour between four and seven P.M., and which is called *lounche* or tea. This meal consists of tea with milk; cheese, ham or egg sandwiches; small cakes and pastries. The next hour for eating in the typical Peruvian family is not earlier than 8 P.M., and many times 9, 10 or 11 P.M. Social activity in Lima begins usually at 10:30 P.M. with dinner; I have dined as late as 11:30 as a guest of a Peruvian hostess and the dinner was completed at approximately 1 A.M. For dinner you would probably have *cope de frute* or fruit cocktail, followed by *caldo* or consommé with the inevitable *fideos*, which resembles our spaghetti. A fish course, probably a shrimp cocktail or white fish, would be served with boiled potatoes. For the main course you might be served any one of a number of meats. The *anticucha* is an interesting dish made with mutton or veal heart cut in small pieces, soaked overnight in a brine of vinegar, salt, various herbs, red pepper and garlic, then fried over a coke flame to a delicious brown, after which a hot sauce is added. *Papas fritos* or deep fat fried potatoes and plain cooked rice is always included. Custard served with molasses is a popular dessert. Cocktails are served before dinner, two kinds of wine during dinner, and a liqueur afterwards. This completes the day's menu, and unless they become hungry and take coffee and sandwiches, they do not eat again until the next morning.—JEAN HAMLEY, *formerly Chief Dietitian, British-American Hospital, Peru, S. A.*

REPORT OF THE NOMINATING COMMITTEE, 1937–1938

In a recent issue of *Science*, the procedure followed in selecting a president for the Botanical Society of America is described. It seemed pertinent to this report. May I quote?

"The committee on nominations of this society meets in secret conclave and decides on a few names, as soldiers are drafted for war. To safeguard the principle of democracy (still dear to science), the entire membership is urged to do likewise. From the preliminary list of victims so chosen the plebiscite of the society makes the final choice of one. He is not 'urged' nor even invited; he is notified. A careful search of the literature of this subject has failed to disclose a single instance of a botanist so lacking in unselfish patriotism as to refuse to serve his botanical country in her time of presidential need".

As in the Botanical Society, your nominating committee met in person and in correspondence to outline a plan of procedure. It first received a recommendation from the House of Delegates by way of the Executive Committee to secure one nominee for the office of president, and two each for the offices of vice-president and secretary. Our Constitution directs that eight nominees be secured to serve on the nominating committee.

Letters asking for suggestions for the slate were mailed in December to members of the Executive Committee and House of Delegates, to past presidents, to presidents of (a) affiliated state associations, (b) non-affiliated state associations, (c) local associations, and to recent former members of the Executive

Committee. By the first of February, a fair percentage of replies had been received, giving decidedly helpful suggestions. The Nominating Committee considered these recommendations and made a tentative slate. Letters were written these prospective nominees asking them to serve their Association in the rôle outlined. There were no refusals, which indicates that our members stand ready to shoulder responsibility and do appreciate the honor conferred by being singled out for office.[1]

The slate the Nominating Committee presents for 1938–1939 is as follows: President-Elect, Beula Becker Marble; Vice-President, Margaret M. Edwards and Emma L. Feeney; Secretary, Angeline Phillips and Gladys Hall Silkey. The Nominating Committee candidates are as follows: Ruth Bowden, California; Ruth E. Forsberg, Washington; Sophia S. Halsted, Michigan; Marie L. Hines, Ohio; Evelyn C. Neale, Virginia; Virginia H. Ray, New York; Jennie Tilt, Florida; and Lute Troutt, Indiana.

[1] *Editor's Note:* Miss Comstock calls attention to the following: According to Article V, Section 6 of the Constitution, it states that "Other nominations may be made by nomination petitions signed by not less than one hundred members of the Association, of whom not more than ten shall be from any one state, assented to in writing by the person or persons named thereon as nominees, and filed with the Secretary at the office of the Association on or before the fifteenth day of August. After the fifteenth day of August an official ballot shall be prepared by the Secretary. In the event that any nominations are made by such petitions the words 'committee nominee' shall follow the name, place of residence, and professional designation of any candidate proposed by the Nominating Committee, and the words 'nomination petition' shall follow the name, place of residence, and professional designation of any candidate nominated by not less than one hundred members as hereinbefore provided".

We also submit a brief biography of each candidate to help you in casting your ballot.—LAURA COMSTOCK, *Chairman*, MARY LOUISE BONE, MARGARET RITCHIE, MARGARET OHLSON *and* HELEN WALSH.

AMERICAN DIETETIC ASSOCIATION NOMINEES 1938–1939

For President—Mrs. Beula Becker Marble, A.B., University of Illinois. Graduate Study: M. S., University of Iowa; Approved Training Course for Student Dietitians, University Hospital, Iowa City; London School of Economics, London, England. *Positions Held:* Research Ward dietitian, Massachusetts General Hospital, Boston; camp dietitian, New York City Y. W. C. A.; volunteer assistant in dietetics, St. Bartholomew's Hospital, London, England; assistant to head of Institution Management, Simmons College, Boston. *Present Position:* Research Unit dietitian, Huntington Memorial Hospital, Harvard Medical School, Boston. *Publications:* Articles in *J. Exper. Med.* 65: 15, 1937; *Am. J. of Cancer*, 31: 268, 1937; New England Hospital Association, Fourteenth Annual Meeting, Report, 1936; *Hospital Management*, 37: 48, 1934. *Professional Activities:* (a) American Dietetic Association—Membership Committee, secretary, Diet Therapy Section chairman, vice-president; (b) Massachusetts Dietetic Association—program chairman, Professional Education Section chairman, president. *Present Office:* (national) vice-president.

For Vice-President: Margaret M. Edwards, B.S., Montana State College. *Graduate Study:* M.A., Columbia University; Cornell University, University of Chicago, New York School of Social Work, Columbia University, and a

Rockefeller Fellowship in 1929. *Positions Held:* home economics teacher, Montana; tea room manager, Florida; dietitian and assistant professor, Florida State College for Women; dietitian, base hospitals, World War; associate professor of education and part-time state supervisor of home economics education, Kansas State College; state supervisor of home economics education, North Carolina; staff associate, American Child Health Association, New York City; director, School of Home Economics, Alabama College, Montevallo. *Present Position:* head, Department of Home Economics, Woman's College, University of North Carolina. *Publications:* Numerous bulletins and magazine articles. *Professional Activities:* (a) American Dietetic Association—national chairman of Program Committee, 1937, member of Journal Board; (b) active in organizing Alabama and North Carolina Dietetic Associations; (c) American Home Economics Association—vice-president, counselor-at-large, southern regional counselor; vice-president, American Vocational Association.

For Vice-President: Emma L. Feeney, B.A., Middlebury College. *Graduate Study:* M.A., Teachers College, Columbia University. *Positions Held:* chemistry teacher, high school, Connecticut; Framingham State Normal, Massachusetts; teacher of nutrition and foods, Pratt Institute, Brooklyn. *Present Position:* head of Nutrition Department, supervisor of evening school food courses, contact worker in day school, Pratt Institute. *Professional Activities:* (a) American Dietetic Association—treasurer, member of Finance Committee, assistant editor of this JOURNAL, national chairman of Program Committee, 1932; (b) treasurer, and president, New York State Dietetic Association; (c) vice-president and president of Greater New York Dietetic Association; (d) cooperated with Cornell University in making survey of nutrition in rural families in Tompkins County, New York. *Present Office:* (national) assistant editor of this JOURNAL.

For Secretary: Angeline Phillips, diploma, Drexel Institute, Philadelphia. *Graduate Study:* B.S., University of Wisconsin; Approved Training Course for Student Dietitians, Fifth Avenue Hospital, New York City; M.S., Teachers College, Columbia University. *Positions Held:* supervisor special diets, Fifth Avenue Hospital, New York City; chief dietitian, Fifth Avenue Hospital; administrative assistant (chiefly teaching of medical students, nurses, patients), University Hospital, Omaha. *Present Position:* director of dietetics, University Hospital, Omaha. *Professional Activities:* (a) American Dietetic Association—former member of Membership Committee and chairman of Placement Bureau Board; (b) member of Omaha Nutrition Council; chairman, Dietetic Section, American Hospital Association. *Present Office:* (national) member of Membership Committee.

For Secretary: Mrs. Gladys Hall Silkey, A.B., Indiana University. *Graduate Study:* M.S., Indiana University; Approved Training Course for Student Dietitians, Indiana University Hospitals. *Positions Held:* administrative dietitian, Indiana University Hospitals; acting director, Dietary Department, St. Louis University Hospitals; instructor in dietetics, St. Louis University. *Present Position:* dietitian, Fermin Desloge Hospital, St. Louis. *Publications:* articles in *Hospitals*, March 1936; *Hospital Progress*, December 1937. *Professional Ac-*

tivities: (a) American Dietetic Association—member of Membership Committee; (b) president, treasurer, Indiana Dietetic Association; president, Missouri Dietetic Association; (c) president, St. Louis Dietetic Association. *Present Position:* (national) member of Membership Committee.

Nominating Committee Nominees 1938–1939

Ruth Bowden, B.S., University of Nebraska; graduate, Approved Training Course for Student Dietitians, Michael Reese Hospital, Chicago; formerly chief dietitian, Santa Barbara Cottage Hospital, Santa Barbara, California; now chief dietitian, The Sansam Clinic, Santa Barbara, California.

Ruth E. Forsberg, B.S., Rockford College; graduate study, Universities of Chicago and Washington; formerly dietitian, Everett General Hospital, Everett, Washington; now chief dietitian, Swedish Hospital, Seattle.

Sophia S. Halsted, B.S., Michigan State College; M.S., University of Michigan; formerly metabolism and research worker, University of Michigan Hospital; now director of nutrition, Department of Health, Detroit, Michigan.

Marie L. Hines, A.B. and B.S., Western Reserve University; M.A., Columbia University; formerly consulting dietitian in charge of University Dining Halls and instructor in institution management, Western Reserve University; now director of dietetics, University Hospitals, Cleveland.

Evelyn C. Neale, B.S., College of William and Mary; graduate, Approved Training Course for Student Dietitians, Medical College of Virginia; formerly assistant dietitian, Medical College of Virginia; now chief dietitian, Retreat for the Sick Hospital, Richmond.

Virginia H. Ray, B.S., New York State College for Teachers; graduate, Approved Training Course for Student Dietitians, New York Hospital, New York City; formerly dietitian, Bridgeport Hospital, Connecticut; now chief dietitian, Albany Hospital, New York.

Jennie Tilt, B.S., M.S., Purdue University; Ph.D., University of Chicago; formerly instructor in chemistry, Purdue University and Wellesley College; now professor of physiological chemistry and nutrition, Florida State College.

Lute Troutt, A.B., M.A., Indiana University; graduate, Approved Training Course for Student Dietitians, Indiana University Medical Center; formerly assistant dietitian, Massachusetts General Hospital; now dietitian at the Indiana University Medical Center, director of food service in Riley Memorial Hospital for Children, Long General Hospital, Coleman Hospital (maternity cases) and commercial cafeteria in the Medical School, director of Approved Training Course for Student Dietitians, and assistant professor of home economics, Indiana University.

BOOK REVIEWS

Eat and Keep Fit. By Jacob Buckstein. New York: Emerson's Books, Inc., 1938, pp. 128. Price $1.00.

Dr. Buckstein has written another book on diet which for clarity of expression and scientific soundness lives up to the high standard of his earlier *Food, Fitness and Figure*. In this small book with its 100 pages of text the author has avoided unnecessary detail, yet appears not to have overlooked all essential and up-to-date information to guide the average layman in the way he should go, dietetically.

The author confines himself to a general discussion of nutrition, chiefly with the needs of the normal adult in mind. Other than this he concerns himself only with very helpful guide lines for the more common deviations from the norm—the under- and overweight adult.

For the obese who would reduce, given a series of diets interestingly labeled "14-day diet", he has charted every forkful for the fourteen fateful days. The same has been done for the lean. In his specifications for carrying out this régime, Dr. Buckstein shows a sound understanding of the obese and their foibles. He cautions against the light breakfast of black coffee and dry toast; he emphasizes the need for medical advice in advance of embarking on reducing exploits and he points out the fallacy and dangers of the various patent weight reducers.

A Diabetic Primer for Children. By Alfred E. Fischer, M.D. Second Ed. 1938. Copies may be obtained from the author, 73 East 90th St., New York City. Price 75¢ postpaid.

The purpose of this booklet is to give the basic facts about diabetes and its dietary management in such a form that a juvenile patient can correlate the material with his own knowledge and so insure more intelligent cooperation with his physician. In this second edition the author has included information regarding protamine zinc insulin, and new prescriptions and food lists have been added. The information contained therein is given in a style that should appeal to the young diabetic. The author acknowledges the assistance of Mary J. Henderson of the Department of Dietetics, Mount Sinai Hospital, New York City, in the preparation of the present revision.

Chicago Standard Budget for Dependent Families. Prepared under the supervision of the Family Service Section of The Division on Family and Child Welfare of the Council of Social Agencies of Chicago. Sixth Ed., revised, 1937; pp. 40.

This current revision was prepared by the Budget Committee of the Family Service Section of which Dr. Lydia J. Roberts is chairman. It contains a minimum standard of normal living on which budget estimates can be made and a schedule for estimating a budget for a dependent family. Included is a budget for a self-supporting family. The section on food has been entirely re-written and other sections have been revised to include present prices. The section on food lists units so that it would be possible for any community to price foodstuffs on this standard. The chapter on clothing gives specifications for each article included in the budget.

The Rockefeller Foundation: A Review for 1937. By Raymond B. Fosdick. New York: Published by the Foundation, 1938, pp. 63.

According to this report of the president, the Foundation is continuing its work along many lines throughout the world. These activities are in the fields of public health; laboratory investigation; medicine and psychiatry; social sciences; and experimental biology. At present, according to Mr. Fosdick, the Foundation is giving its major support to experimental biology. It is felt that the biological sciences are, broadly speaking, 100 years behind the development of chemistry and physics. The Foundation appropriated roughly over a million dollars in this field, assigned to universities in this country and abroad. The subjects for investigation concern: physiology and chemistry of sex hormones; nutrition research; enzyme chemistry; and organic chemistry.

Another activity of the Foundation is the developing of "New Horizons for Culture". Working not only through universities but agencies of an entirely non-academic character, the Foundation has endeavored to encourage promising developments in the drama, motion picture and radio, as well as in museums and libraries.

CURRENT LITERATURE

American Journal of Digestive Diseases

Vol. 5, April 1938

* The effect of orange juice on gastric acidity. C. Dimmler.—p. 86.
* Protamine insulin and the high carbohydrate-low fat diet in diabetes mellitus. S. Harris and S. Harris, Jr.—p. 88.
*Hydrophilic colloidal diet. F. M. Pottenger.—p. 96.
*Gastric acidity in chicks with experimental gastric ulcers. G. Cheney.—p. 104.
*Factors which influence the regeneration of blood following hemorrhage from peptic ulcer. D. L. Wilbur.—p. 125.

EFFECT OF ORANGE JUICE ON GASTRIC ACIDITY. Orange juice is a buffer solution made up mainly of primary, secondary and tertiary salts of citric acid. It contains only small amounts of free acid. The addition of orange juice did not affect the pH of the gastric content in normal individuals. It is probably safe to give orange juice to patients with peptic ulcer.

PROTAMINE INSULIN. The insulinogenic apparatus of the diabetic may be restored to practically normal function in some of the mild and moderately severe cases of diabetes by the use of protamine insulin and the high carbohydrate-low fat diet. There is reason to believe that an excess of fats in the diet inhibits insulinogenesis and that such diets may lower tolerance permanently. Carbohydrates stimulate the secretion of insulin and may bring about a permanent increase in sugar tolerance. Experience with high carbohydrate-low fat diets and the use of protamine insulin has shown that in the mild and moderately severe cases of diabetes there is reasonable hope for an approximate cure. Three test diets are outlined in detail.

HYDROPHILIC COLLOIDAL DIET. Hydrophilic colloids bring about conditions in the stomach during digestion which approach those resulting from the consumption of foods in their natural state. These colloids lessen gastric irritation by absorbing the digestive secretions of the stomach. Gelatin, because of its availability, relatively low cost, non-toxicity, adaptability as an item of dietary and its thorough digestibility, becomes an admirable hydrophilic colloid for dietary usage.

GASTRIC ACIDITY IN CHICKS WITH ULCERS. Experimental gastric ulcers may readily be produced in chicks on a deficient diet. Gastric acidity in chickens following histamine injection is comparable to that found in man. The cause of the ulcers and the hyperacidity is apparently the lack of a dietary factor which has a specific effect on the resistance of the gastric mucosa.

REGENERATION OF BLOOD. If recovery from hemorrhage is to be rapid it is essential to have abundantly available in the diet such substances as iron, certain amino acids, copper, vitamin C, and some components of the vitamin B complex, essential for the blood regeneration. Alkaline therapy used in the treatment of peptic ulcer appears to interfere with the utilization of dietary iron. Even a diet rich in iron may have practically no effect on the formation of hemoglobin during the period of alkalization.

American Journal of Diseases of Children

Vol. 55, March 1938

*Basal metabolism standards for children. F. B. Talbot.—p. 455.
*Retardation of growth in diabetic children. J. D. Boyd and A. H. Kantrow.—p. 460.
*Diet in the treatment of diabetes mellitus in children. W. E. Nelson and D. Ward.—p. 487.
Relation of the creatinine-height coefficient to various indexes of nutrition. A. L. Daniels, M. K. Hutton and B. Neil.—p. 532.
*Vitamin B_1 intake of nursery school children. E. Robb, and E. M. Vahlteich.—p. 544.

BASAL METABOLISM. Standards of metabolism for girls and boys, when tested clinically on both normal and abnormal children, have given results which are more consistent than other standards.

GROWTH RETARDATION IN DIABETES. Retardation of growth will be prevented or corrected if juvenile diabetes mellitus is suitably controlled through adequate diet and avoidance of frequent or continuous glycosuria. Physical retardation is a result of nutritional or allied metabolic inadequacies rather than a consequence of endocrine disturbances, unless prolonged observance of an ample dietary regimen has failed to maintain a normal rate of growth.

DIET FOR DIABETES MELLITUS. There is a fairly wide range within which the dietary allowance of diabetic children may be varied. Meals can be planned suited to the diabetic child as well as his entire family. Measured diets help to safeguard the child's growth, insure a balanced dietary intake and instruct the child concerning the content of an adequate diet.

VITAMIN B_1 INTAKE. The healthy, active nursery school child will get sufficient vitamin B_1 if at least 40 per cent of the total calories is derived from milk, 18 to 20 per cent from cereals (at least half of which are from whole grain products), and 16 to 22 per cent from fruits and vegetables, with the daily use of 3 to 4 ounces of orange juice or its equivalent in tomato juice. The vitamin B_1 content of the diet can be increased by the use of whole wheat bread and cereal reenforced with wheat germ.

American Journal of Nursing

Vol. 38, April 1938

Diet during treatment of venereal diseases. D. Davidson.—p. 438.

Annals of Internal Medicine

Vol. 11, March 1938

*Chronic hypochromic anemia in women (its gastrointestinal, gynecologic, endocrine and psychiatric features). S. G. Meyers, A. H. Price, H. C. Mack, L. J. Foster and E. A. Sharp.—p. 1590.

CHRONIC HYPOCHROMIC ANEMIA. In 26 women with hypochromic anemia observed over a period of 27 months, deficient meat and iron intake, deficient gastric acidity and other digestive disturbances, hypothyroidism, multiple pregnancy, menorrhagia and other forms of bleeding occurred often enough to be of etiologic significance. The blood levels rose to normal under anti-anemic therapy. Satisfactory clinical improvement was obtained only when a comprehensive program of gastrointestinal, endocrine and psychiatric treatment was instituted in addition to hemopoietic therapy.

Archives of Internal Medicine

Vol. 61, March 1938

*Iron retention in pernicious anemia, lead poisoning and myxedema. W. M. Fowler and A. P. Barer.—p. 401.

IRON RETENTION. Iron balance studies were made of patients with pernicious anemia, chromic lead poisoning and myxedema. Iron and ammonium citrates administered in combination with a liver fraction produced a retention of from 25 to 34 per cent of the administered iron. This is comparable to the amount of iron retained in hypochromic anemia under similar circumstances.

Archives of Pediatrics

Vol. 55, March 1938

*The value of irradiated milk in infant feeding. W. H. Clark.—p. 178.

*Value of cod liver oil concentrate in preventing weight loss in the new-born. J. R. Dolce.—p. 185.

IRRADIATED MILK IN INFANT FEEDING. Fifty children, aged from one month to one and one-half years, were studied to determine the effect of different amounts of vitamin D milk. Irradiated vitamin D milk is protective against rickets for children of all ages. Most favorable results were obtained in children under 8 months of age. The cost is less than ordinary milk plus the cost of vitamin D. Includes review of literature from 1919 to 1938.

WEIGHT LOSS IN NEW-BORN. In 64 new-born infants studied to determine the value of an A and D vitamin nutritional supplement in reducing the weight loss in the first 10 days of life, marked reduction in weight loss was secured through the administration of a council accepted cod liver oil concentrate three times daily from the day of birth. Similar weight loss reductions were obtained in a group of 17 infants receiving anointments with an antiseptic oil enriched with vitamins A and D.

British Medical Journal

No. 4031, April 9, 1938

*Calcium and phosphorus deficiencies in a poor human dietary. W. E. Gaunt, J. T. Irving and W. Thomson.—p. 770.

DIETARY CALCIUM AND PHOSPHORUS DEFICIENCIES. The nutritional value of a poor human dietary can be greatly improved by the addition of milk and green food supplements. Experiments show that in rats bred from stock this improvement is due largely to the calcium and phosphorus contained in the supplements. A deficiency of calcium in particular is likely to occur in human diets. An increased consumption of milk is the most efficient means of insuring an adequacy in this respect.

Cereal Chemistry

Vol. 15, March 1938

*Improving the nutritive value of bread by the addition of dry milk solids. B. W. Fairbanks.—p. 169.

IMPROVING NUTRITIVE VALUE OF BREAD. The *ad libitum* method of feeding demonstrated that the addition of milk solids increased the nutritive value of water bread. Statistics indicate that the per capita consumption of liquid milk is below that recommended by nutrition authorities. The addition of milk solids to bread is an excellent method of augmenting the American dietary.

Food Research

Vol. 3, Jan.-Feb., March-April 1938

*Purpose of the Food Technology Conference. C. Prescott.—p. 1.

Recent developments in canning fruit juices. S. H. Ayers.—p. 5.

*Advancement in sterilization methods for canned foods. C. O. Ball.—p. 13.

Modern practice in fish preservation by cold. L. Berube. —p. 69.

Color of meat. J. Brooks.—p. 75.

Recent developments in canning technology with reference to spoilage control.—p. 91.

*Carotene and ascorbic acid content of fresh market and commercially frozen fruits and vegetables. G. A. Fitzgerald and C. R. Fellers.—p. 109.

*Vitamin C content of vegetables. VIII. Frozen peas. R. R. Jenkins, D. K. Tressler and G. A. Fitzgerald.—p. 133.

Gas storage of meat and eggs. T. Moran.—p. 149.

Cristallisation et dessiccation de certains protéides sous l'action du froid. M. Piettre.—p. 161.

Essais de "quick freezing" appliqué aux grosses pièces de Viande. M. Piettre.—p. 167.

Microbiology in relation to food preservation. S. C. Prescott and F. W. Tanner.—p. 189.

*Determination of optimum conditions for domestic refrigeration. B. E. Proctor and D. G. Greenlie.—p. 199.

Apparatus for measurements of chewing resistance or tenderness of foodstuffs. N. N. Volodkevich.—p. 221.

FOOD TECHNOLOGY. Nearly fifty years ago Mrs. Ellen R. Richards began her lifelong researches in the chemistry of foods and the economics of home management. These pioneer researches established a new branch of chemistry in this country and a new profession for women. From this early work has grown a continuously broadening interest leading to courses of instruction and research now called food technology or food engineering.

STERILIZATION, CANNED FOODS. Methods of food preservation are discussed before and after Appert. Included is a comprehensive view of the present status of high-short sterilization by heat and a bibliography on the subject of heat processing of canned food.

CAROTENE AND ASCORBIC ACID CONTENT, FRESH AND COMMERCIALLY FROZEN FRUITS AND VEGETABLES. Includes the vitamin A values for frozen fruits and vegetables. Preliminary tests indicate that frozen products retain all their vitamin A during all their processing and freezing. Storage at low temperature in practically impervious package indicates a fairly complete retention of Vitamin A up to the time of delivery. Vitamin C values are included for numerous commercially frozen fruits and vegetables, including comparisons with fresh market products. Climatic, soil and possibly other factors besides maturity have important bearing on vitamin C content of both fresh and frozen food.

VITAMIN C CONTENT—VEGETABLES. Studies indicate a 30% loss in ascorbic acid content of peas during commercial preparation for freezing. The minimum loss of vitamin C occurred when the blanching period was just sufficient to inactivate ascorbic acid oxidase. Thawing at room temperature for 24 hours in sealed moisture-proof packages resulted in no appreciable loss.

FOOD PRESERVATION. As a result of a series of investigations conducted on various phases of food preservation over a period of years, it is indicated that low storage temperature and conditions of high humidity, combined with moderate air velocity are desirable. Results obtained with a number of common foodstuffs indicate that temperatures of 40°F. or lower and air velocities of 12 ft. per minute with relative humidity of 85% and higher, provided more satisfactory storage conditions.

Journal of Allergy

Vol. 9, March 1938

*Evidence of group specific and species specific sensitization to pollen. G. D. Grubb and W. T. Vaughan. —p. 211.

SENSITIZATION TO POLLEN. Study of closely related pollens derived from the same botanical

families shows evidence of the existence of group specific and species specific allergens. About half of those patients allergic to the pollen of food plants, wheat, corn and beet, were also allergic to the corresponding foods.

Journal of Biological Chemistry

Vol. 123, April 1938

*The interaction of vitamin B_1 in enzyme reactions. H. Tauber.—p. 499.

*Liver lipids of the laying and non-laying bird. F. W. Lorenz, I. L. Chaikoff and C. Entenman.—p. 577.

*Radioactive phosphorus as an indicator of phospholipid metabolism. II. The rôle of the stomach, small intestine, and large intestine in phospholipid metabolism in the presence and absence of ingested fat. B. A. Fries, S. Ruben, I. Perlman and I. L. Chaikoff. —p. 587.

VITAMIN B_1 IN ENZYMIC REACTIONS. Much of the vitamin B_1 of plants is present in the unphosphorylated state while in mammalian tissues all of the vitamin appears as the pyrophosphoric ester. Experiments show that the duodenal enzyme preparation has the ability to convert vitamin B_1 into cocarboxylase which functions as the coenzyme for a specific pyruvic acid dehydrogenase under a variety of conditions. This conversion of vitamin B_1 to the active coenzyme appears to be of great physiological importance.

LIVER LIPIDS OF BIRDS. A study was made of the relation of diet, sex, and ovarian activity to the liver of the single comb white Leghorn fowl. The same concentration of liver lipids was found in mature as in immature male bird and in immature female bird. The onset of maturity led to a pronounced increase in neutral fat in the liver of the female. An increase in fat content of the diet led to a decrease in neutral fat content of the liver of the actively egg laying bird. The neutral fat content was more variable in the liver of birds fed a low fat diet than in those fed a high fat diet.

PHOSPHOLIPID METABOLISM. In the absence as well as presence of ingested fat, the major part of the phospholipid turnover by the gastrointestinal tract can be ascribed to the small intestine, the stomach and large intestine playing but minor rôles in this type of metabolism. The removal of tissues very active in phospholipid turnover; namely, the gastrointestinal tract and kidneys, does not markedly influence the phospholipid turnover by the liver.

Journal of Clinical Investigation

Vol. 17, March 1938

*Alkaline tides. G. D. Barnett and F. E. Blume.—p. 159.

ALKALINE TIDES. In quantitative measurements of so-called morning alkaline tide in two normal resting subjects, the morning alkaline tide appeared earlier under water diuresis, and was temporarily inhibited by light exercise and ingestion of food. Soda or orange juice taken the night before produced a larger alkaline tide, with little effect on acid excretion during the intervening night period.

Journal of Nutrition

Vol. 15, April 1938

*The measurement of the efficiency of diets. E. B. Forbes, R. W. Swift and A. Black.—p. 321.

Further studies on the unsaturated fatty acids essential in nutrition. O. Turpeinen.—p. 351.

*The effect of melting point of fat upon its utilization by guinea-pigs. C. M. McCay and H. Paul.—p. 377.

*Effect of feeding high levels of copper to albino rats. R. Boyden, V. R. Potter and C. A. Elvehjem.—p. 397.

EFFICIENCY OF DIETS. New equipment and two experimental procedures were demonstrated for the comparison and the measurement of the nutritive values of human diets. A series of water-sealed respiration chambers determine quantitative and qualitative character of metabolism of rats by means of carbon and nitrogen balance method, under normal conditions of physical activity.

MELTING POINT AND UTILIZATION OF FAT. A variety of oils were fed to guinea-pigs to determine if the melting point of a fat influenced its utilization in herbivora. The fecal lipid tended to be much higher after feeding the higher melting fats. Even castor oil was well absorbed.

HIGH LEVELS OF COPPER. Slight toxicity was observed in rats receiving 500 parts per million of copper. Growth records show increasing toxicity on higher levels. The copper content of the blood and spleens increased a maximum of 2 to 5 times while the liver increased to a maximum of 300 times normal.

VITAMIN B_1 REQUIREMENT OF CHICKS. The vitamin B_1 requirement of the chick is remark-

ably constant. The chick is more sensitive than the rat to small additions of the vitamin to the basal ration.

Journal of the American Medical Association

Vol. 110, April 2, 1938

*Effect of vitamin B_1 on peripheral neuritis of pellagra. T. D. Spies and C. D. Aring.—p. 1081.
*Chemical aspects of riboflavin. L. E. Booher.—p. 1105.
*Thiamin chloride and nicotinic acid in pellagra. Current comment.—p. 1115.

Vol. 110, April 9, 1938

Riboflavin. A. G. Hogan.—p. 1188.
*Cystine and methionine. Editorial.—p. 1196.
The more abundant diet. Current comment.—p. 1197.

Vol. 110, April 16, 1938

*Riboflavin: Dietary sources and requirements. H. C. Sherman and C. S. Lanford.—p. 1278.

Vol. 110, April 23, 1938

*The teaching of nutrition to students of medicine. S. P. Lucia and N. Simmonds.—p. 1335.
Medical treatment of hyperthyroidism with a high fat diet. S. Soskin and I. A. Mirsky.—p. 1337.
*The relationship of vitamin A to the health of infants. J. M. Lewis and L. H. Barenberg.—p. 1338.

PERIPHERAL NEURITIS. Observations suggest that vitamin B_1 deficiency has a rôle in development of clinical manifestations of peripheral neuritis associated with pellagra. Certain patients fail to absorb vitamin B_1 effectively by mouth, and it is imperative that they be given parenteral injections. These injections shorten convalescence and are desirable from the standpoint of prompt relief of pain. Vitamin B_1 does not cure glossitis and stomatitis of pellagra, but observations suggest that nicotinic acid, which does cure these symptoms, will not cure the peripheral neuritis.

RIBOFLAVIN. Riboflavin is a yellow green-fluorescent water-soluble pigment widely distributed throughout the plant and animal kingdoms. Riboflavin forms a phosphoric acid ester which combines with a protein to yield a yellow oxidation enzyme. This enzyme is present in the cells of all the higher forms of life, and is concerned with chemical reactions involved in cell respiration.

THIAMIN CHLORIDE AND NICOTINIC ACID. Prompt relief of spontaneous neuritic pain in pellagra results from the intravenous injection of thiamin chloride. Vitamin B_1 does not appear to cure the glossitis and stomatitis of pellagra but nicotinic acid does relieve these symptoms. Pellagra appears to be the result of more than one factor. Both thiamin chloride and nicotinic acid deserve further intensive study in their relation to this disease.

CYSTINE AND METHIONINE. Man's knowledge of sulfur dates back to the time of the ancients. Most of this element that is concerned with metabolism enters the body in organic combination, largely as proteins. Cystine and methionine are the sulfur-containing amino acids. The latter but not the former is essential for animal nutrition. Cystine can stimulate growth when methionine is present in suboptimal quantities.

RIBOFLAVIN. Estimates of amounts of riboflavin required for normal human nutrition are necessarily matters of judgment rather than of direct measurement. Riboflavin appears to be formed primarily in the green leaves of actively growing plants and to remain there in higher concentration than elsewhere. Milk is a relatively stable and dependable source of riboflavin and will almost always be the chief source in the dietaries of children. Tables showing the approximate riboflavin values of certain foods and the relative prominence of certain types of food are given.

TEACHING NUTRITION TO MEDICAL STUDENTS. The study of nutrition should have a place among the fundamental courses in a medical school. A brief summary of the University of California Medical School course is given. Students were afforded an opportunity to review the physiology and biochemistry of digestion in the normal person and to learn of the alterations that occur in diseased individuals. Demonstrations illustrated the importance of vitamins and minerals in the maintenance of good health. Palatability, proper combinations of food, attractiveness, service and cost of food were stressed as important considerations in planning diets.

VITAMIN A. Investigation revealed that the health of a group of infants receiving one-fourth the amount of vitamin A present in the average

diet was just as good as that of a group receiving from 17 to 34 times as many units of vitamin A. The low vitamin A diet contained, therefore, an amount of vitamin A which was above the minimum requirement as judged by the nutritional state of the infants and their resistance to infections. It appears that the average diet contains at least 4 times as many vitamin A units as the minimum requirement.

Military Surgeon

Vol. 82, January 1938

*Diabetes and protamine insulin. E. P. Joslin.—p. 1.

DIABETES AND PROTAMINE INSULIN. The knowledge of diabetes should be made more universal so that the condition may be discovered soon after the onset of the disease. The public should know simple measures now available in treatment. The greatest impetus to the extension of the use of insulin has been the discovery of protamine zinc insulin. The diabetic taking this stores glycogen in his liver, muscles and skin so that he resembles a normal individual. The action of protamine zinc insulin is slow and persistent for 24 hours or more. The diet must be adjusted to this slow action by distributing the food evenly throughout the day.

Public Health Reports

Vol. 53, April 1, 1938

*Differences in opportunities for health. J. W. Mountin and H. O'Hara.—p. 485.

DIFFERENCES IN HEALTH OPPORTUNITIES. Data in support of the thesis that opportunities for health are closely coordinated with economic status is presented. Sufficient evidence of the inequality of opportunity has been established through the use of statistics which show that illness rates are higher for the poor than for the well-to-do and that general medical care, surgical operations, immunizations, and dental care are impeded by inability to pay. Furthermore, health departments and hospitals are not so organized as to render adequate service to those in greatest need.

Science

Vol. 87, April 22, 1938

*Vitamin L. W. Nakahara, F. Inukai and S. Ugami.—p. 372.

VITAMIN L. The existence of a specific dietary factor for lactation was first established in 1934. A diet can be formulated which is entirely adequate except for lactation. It is proposed that these lactation factors be called vitamin L_1 and vitamin L_2.

INSTITUTION MANAGEMENT

American Restaurant Magazine

Vol. 21, April 1938

*Avoid cash-counter tragedies. Editorial.—p. 28.
Operators discover profits in soup merchandising. H. C. Siekman.—p. 32.
Menus that bring them back. Feature.—p. 40.
*Does 40% food cost mean loss of quality. G. L. Wenzel.—p. 44.
*Associations study radio ad-venture. G. Rawlins.—p. 54.

CASH-COUNTER PROFITS. Since he sees every customer on leaving, the cashier may be the best means of building good will. In a survey of cashiers, their habits and training, methods have been listed to help this worker. Recommends announcing the denomination of the bill as received, counting change aloud and never making change twice to prevent errors. Ways to avoid difficulties with customers who insist they gave a larger bill as well as means of identifying counterfeit money are listed.

40% FOOD COST. Describes a system of specification cards and control price cards to help keep the food cost on a desirable level.

RADIO AD-VENTURE. Fifteen minute electrically transcribed programs designed to influence listeners to "eat out" more often will soon be available to restaurant operators for broadcasting on local stations.

Buildings and Building Management

Vol. 38, April 1938

Burglaries and hold-ups. L. R. Bloomenthal.—p. 36.
*Analyzing operating methods to reduce expense. A. B. Mason.—p. 41.
*Philadelphia managers study service facilities. T. F. Egan, Jr.—p. 43.
Surplus money proceedings in New York State. D. L. Samuels.—p. 49.
*Wiring for better lighting and air-conditioning. E. A. Freund.—p. 53.

REDUCE OPERATING COST. Evaluates five rules that lower cost of maintenance: establish check figures to compare with costs; provide written instructions (time and money lost by employee indecision); keep complete operating records; compare results regularly with check figures; when in doubt, call in an expert, especially when installing expensive equipment.

SERVICE FACILITIES. Stresses proper direction of elevator system; schedules and safety rules for mechanics; standards and typed instructions supplemented with required record of operator activity.

REWIRING. Economical means of installing new wiring needed for modern air-conditioning or lighting facilities.

Chain Store Age

Vol. 14, March 1938

Chain store fronts—new models.—p. 16.
*Air-conditioning demands advance planning. C. C. Mahan.—p. 27.

Vol. 14, April 1938

*Yardsticks for measuring men. J. E. Foster.—p. 21.
Windows "wrapped" for store opening. J. Gregg.—p. 27.
Semi-monthly efficiency checks hold Scott-Burr standards high. C. D. Eversfield.—p. 29.

AIR-CONDITIONING. An investment in air-conditioning equipment may be made up in increased efficiency only if building is insulated and heat producing units set apart and properly ventilated. Log Cabin candy stores in Baltimore satisfactorily maintained temperature 10 degrees below the outer air in summer with this type of installation.

MEASURING MEN. Prospective executives are rated on evidence of following characteristics: judgment, initiative, personality, loyalty, unselfishness, cooperation, expressiveness, disposition, understanding, enthusiasm, and desire to assume responsibility.

Consumers' Guide

Vol. 4, February 1938

*Crusade for facts. Editorial.—p. 3.
Macaroni—to your taste. Editorial.—p. 10.
Your food supplies and costs. Editorial.—p. 16.

Vol. 4, March 1938

*Writing rules for trade. Editorial.—p. 3.
*Where do you park your meat? Editorial.—p. 13.

Vol. 4, April 1938

*Rayon comes of age. Editorial.—p. 3.
*What is soap? Editorial.—p. 8.
*The wicked fly. Editorial.—p. 13.
Strawberry news. Editorial.—p. 16.

BUYING. Tells how the consumer may learn to buy by specification. Describes simple tests for everyday articles such as toothpaste.

TRADE RULES. Federal Trade Commission is helping trade groups establish "trade practice rules" designed to eliminate waste. Original action and enforcement effected by business. Value of trade practice conferences would be enhanced by greater consumer participation.

MEAT STORAGE. Poor refrigeration accounts for most meat spoilage. Store raw meat uncovered, the dried surface checks bacterial action at temperature not over 47°F. Cooked meat may be loosely covered with wax paper to prevent drying and stored in the refrigerator not over 48°F. Use ground meat immediately.

RAYON. Makers of synthetic fiber have accepted the name, Rayon, for their products and with it the full responsibility of a new fiber. Its presence in any fabric is announced; labels and advertisements include methods of washing. This article tells history, characteristics of the fiber, and care necessary to get best service from rayon products.

SOAP. Whether perfumed bath water or strong laundry chips, soap is "a substance resulting from the reaction of alkalis on animal and vegetable fats." What goes into it and how it is made; why soap cleanses; and the uses of each type is well told in this article.

FLIES. To kill the first fly of the spring is only the beginning. Find and destroy its breeding places, keep it out of the house with screens, and poison the unlucky one that passes the barricade. Breeding habits and formulas for sprays and poisons are included.

Hospitals

Vol. 12, April 1938

*Food waste—its detection and control. G. A. Knight.—p. 28.
*Feeding of hospital employees. M. G. Dana.—p. 59.

FOOD WASTE. Purchasing, preparation, and service are the controls of waste, rather than weighing the waste. Buying fillets of fish is more economical than buying whole fish. Careful purchasing of meats and all other products is essential in prevention of waste. Gives good ideas for food preparation and service to prevent waste.

FEEDING HOSPITAL EMPLOYEES. Diversified groups of employees in the hospital make it difficult to serve food that will be liked by all. Gives suggestions for planning menus and making the food and meal time attractive.

Hospital Management

Vol. 45, March 1938

*Sixteen years of hospital dietetic service in veterans administration facilities. G. Bulman—p. 31.
*Apples for winter weary appetites. H. Ashcraft.—p. 32.

VETERANS ADMINISTRATION FACILITIES. Regulations concerning dietitians who wish to enter the service of the Veterans Administration. Duties of the head dietitian and her assistants. Development and progress of the dietetic service during the past sixteen years.

APPLES. Varieties of apples, seasons when they are available and some excellent recipes for their use.

Horwath Hotel Accountant

Vol. 18, April 1938

*Food and beverage costs.—p. 3.

FOOD COSTS. General average food cost per dollar sale declined 3% in January according to figures for hotels. Wholesale food price index decreased 12%. In general, hotels had lower food costs per dollar sale than a year ago. Beverage costs also decreased slightly over a year ago.

Hotel Management

Vol. 33, April 1938

*New books.—p. 350.
*$150,000 builds 600-seat coffee shop.—p. 371.
*Where cooking is done electrically.—p. 385.
What's new in Boston hotels.—p. 393.
A menu a day for a month. J. H. Breland.—p. 422.

NEW BOOKS. Among the interesting and valuable new books for those interested in food work are *Restaurant Management: For Luncheon and Supper Guests* by Alice Bradley; and *Food Buying and Our Markets* by Day Monroe and Hazel Kyrk.

COFFEE SHOP. Illustrations and write-up of Los Angeles' Biltmore Coffee Shop, claimed to be the world's largest, finest, and fastest coffee shop in existence. Reasonable and varied menu, coffee ground at the urn before each making, dust and wrinkle-proof wardrobes for checking hat and coat right at your seat, springless rubber seats and many other innovations make this a truly modern coffee shop.

COOKING ELECTRICALLY. In the Custer hotel, Galesburg, Illinois, serving twenty to twenty-five thousand meals per month and using nine pieces of heavy duty cooking and warming equipment the average cost for electricity with a rate of 1.6–1.7 cents per K.W.H. runs under $4.50 per day.

Hotel Monthly

Vol. 46, March 1938

*On an I.C.R.R. "Panama Limited" dining car.—p. 26.
How to bone a shad.—p. 37.
Students of institution economics at the University of Chicago listen to a salad authority.—p. 46.

Vol. 46, April 1938

Modernizing refrigeration in a small hotel. Editorial.—p. 14.
*1938: Hospitalities around the world. H. B. Meek.—p. 18.
How a low-ceilinged island area was successfully air-conditioned. Editorial.—p. 22.
The care and cleaning of upholstery.—p. 26.
Economics of rehabilitation and maintenance. F. W. Eckert.—p. 30.
*Apartment house services. Editorial.—p. 32.
Hot cheese tart. F. Pointreau.—p. 33.
*Famous foods from the Pfister. Editorial.—p. 34.
Renting apartments on the cost plus plan. E. M. Knoff—p. 37.

DINING CAR. Interesting decoration, cleanliness, fresh vegetables, sea-food features, and trained workers make the service distinctive. Includes methods of caring for china, silver, and glassware on dining car.

PENSIONS. Discussion of the quality of hotel service in Europe. The pension, a cross between a good family hotel in America and our tourist home, promotes travel on the continent among people of moderate means.

APARTMENT HOUSE SERVICE. Daily operating problems pertinent to residential hotels.

MERCHANDISING. The Hotel Pfister, Milwaukee, has been successful in stimulating orders for specialties in their English Tavern by an effective display just inside the front entrance. A circular table displays items listed on menu, arranged attractively with individual signs giving the name of the dish, its price and even notes on the preparation.

Journal of Home Economics

Vol. 30, April 1938

An adequate standard of living for women wage earners in New York State. F. S. Miller.—p. 217.
Trends in consumer education. B. Dodge.—p. 235.
*Nutrition education material for social welfare work. E. Maslansky.—p. 242.
*Reliability of the thiocyanate method for the determination of iron in acid digests of food and feces. R. M. Leverton.—p. 252.
*The effect of adequate school lunches upon the physical growth of Mississippi school children. E. Frazier.—p. 258.

NUTRITION EDUCATION. Need of clear and accurate presentation of nutrition facts stressed. Nutritionist the intermediary between the research technician and the lay public.

IRON ANALYSIS. Thiocyanate method for the determination of iron with the acid digest method of preparing samples is evaluated. Definite techniques are described with a view toward standardization of a practical method for iron analysis. The acceptance of a dependable routine procedure will facilitate research of the iron content of foods and the body's use of iron.

SCHOOL LUNCHES. Results of nutrition study in Mississippi on the effect of adequate school lunches upon the physical growth of children between ages of 6 to 12 years appear to show a greater tendency toward physical improvement for the study group than for the control group. One hundred children were selected for the study from each of the 25 counties having a full-time health department. The paper evaluates 731 of the records collected, 368 for children with the adequate noon lunch and 363 children in the control group from families of comparable socio-economic level who did not receive an adequate lunch. Analysis of growth of children in two groups in the study shows that 3.7% of children receiving the lunches and 1.3% of children in control group made some gain each month. The children showed a seasonal variation in growth coinciding with observations previously made by investigators in England, Sweden and Germany.

Modern Hospital

Vol. 50, April 1938

Kitchen ills and cures—a consultant's close range view. p. 67.
*Food for child patients. E. N. Ylvisaker.—p. 94.
*Equipped for service. A. Hirsh.—p. 98.

FEEDING CHILDREN. Feeding and teaching problems with children as solved by the dietitian in charge of the Children's Hospital, Cincinnati.

FOOD SERVICE. Without adding appreciably to the cost, the installation of several units of new equipment has facilitated service in the nutrition department of the Miami Valley Hospital, Dayton, Ohio.

Nation's Schools

Vol. 21, April 1938

*Analyze your food costs. E. Gilbert.—p. 66.
Technique for dipping ice cream.—p. 70.
Clean hands.—p. 70.
*Care of wood floors.—p. 72.

ANALYZING FOOD COSTS. The system of accounting used successfully at the Rayen School in Youngstown, Ohio, provides records covering purchases, storeroom, kitchen preparation, serving, and weekly and monthly statements. Method of analyzing and correctly interpreting records are discussed with explanation of the food control and cost control effected.

WOOD FLOORS. Wood floors should be thoroughly waxed and cleaned three times a year. The floors are washed, a water emulsion wax applied and when dry polished; wax again applied and polishing repeated. Eight to ten average class rooms can be cleaned in a day.

Personnel Journal

Vol. 16, April 1938

*Psychology of cooperation. C. S. Slocombe.—p. 325
*Personnel work in colleges. F. H. Kirkpatrick.—p. 340.

COOPERATION. Development of a plan of rating fellow workers and superiors has lead to creation of live interest and supplanted bickering in many large plants. The rating keeps the men's minds constructively occupied. Workers welcome plan as an opportunity to rate themselves and see where they stand; superintendents consider it increases the foremen's knowledge of the men, their work and the worker's knowledge of his job; supervisors believe it coordinates all functions within the plant.

COLLEGE PERSONNEL WORK. The American College Personnel Association has adopted a comprehensive charter which puts emphasis on the development of the student as a person rather than upon his intellectual training alone. Its purpose is to make college personnel work a much more effective instrument than it has been in the past.

Practical Home Economics

Vol. 16, April 1938

*Cafeteria organization. J. Hall.—p. 163.

CAFETERIA ORGANIZATION. This article sets forth the ways in which the Olean High School, New York, has grown to meet the increasing number of students it serves. Facts concerning employees and menu set up are given.

Restaurant Management

Vol. 42, April 1938

*So you are over 40! J. O. Dahl.—p. 291.
Unique equipment that speeds service in large dining rooms. A. Easton.—p. 292.
How Louisiana State University serves 9500 meals each day.—p. 297.
Ideas of the month.—p. 305.
*San Antonio guards public health by closing 1018 food shops. B. C. Reber.—p. 309.
*Twelve experts show you how to prepare mashed potatoes.—p. 314.
*The chef says—and the manager says.—p. 347.

THE OLDER MAN. An editorial for all, whether over or under 40, explaining why the older man is often replaced by a younger one.

PUBLIC HEALTH. San Antonio, Texas, health ordinances governing preparation, handling and sale of foods and food products, revised to meet present day requirements, prove effective in operation. Detailed outline of rules, inspections and systems of grading catering establishments as adopted by Health Department in January 1936. Used in the initiation of bi-weekly inspections of places in each of the 15 districts in the city, this resulted in 1018 establishments being closed or denied licenses during the first year this modern control was used. The 15 field inspectors were carefully selected and trained, and their work constantly checked. During the first year, 70 was the minimum grading under which an eating place could operate and card was identified with a bright red seal, the minimum this year is 80 and card is identified by a pink seal. Establishments with a grading of 90–99 are given a light blue seal; those rating 100, a gold seal. Cost of individual inspection has been reduced from 24 to 14.8 cents and the time required from 23 to 15.2 minutes.

MASHED POTATOES. Is it more satisfactory to peel potatoes before or after boiling? This is one of the many questions taken up in a discussion of the best way to prepare and serve mashed potatoes by ten food experts.

JOB REQUIREMENTS. A chef would like his manager to criticize his department intelligently, and a manager would like his chef to inspect his icebox at least once a day. These are only two of a list of similar suggestions made out by a chef and a manager as to the requirements each expects of the other.

The Science Leaflet

Vol. 11, March 1938

*Youth and old age.—p. 29.
*Standardization of fruits and vegetables. M. L. Runzo.—p. 31.

FOOD AND LONGEVITY. A discussion of research work indicating that forced growth in the early life of an animal leads to an earlier old age and a shortened life span.

"BEST" OR "FANCY". A summary of what is being accomplished by federal laws on grading and standardizing of fresh fruits and vegetables and their value to the consumer and producer.

NEWS NOTES

American Dietetic Association Annual Meeting, Milwaukee, October 9–14, 1938. Program plans under the direction of Dr. Margaret Hessler Brookes indicate a program brimming over with topics covering a sufficiently wide field of interests to appeal to all visitors. Noted administrators will appear. Marie Casteen of the Statler Hotels System will speak on "Quality in Quantity Production." The subject of the nutrition of the school child will be covered by authorities such as Dr. Mary Swartz Rose, speaking on "The Health of the School Child" and Dr. Jennie Tilt, who will tell of the school nutrition program as presented by the American Association of Health and Physical Education of the National Educational Association.

Dr. C. A. Elvehjem will speak at the opening general session. Other research workers and clinicians in the field of medicine will tell of current developments in medicine related to diet therapy.

Tuesday afternoon, Dr. Francis Murphy of Marquette University will speak on "The Relation of Diet to Various Forms of Bright's Disease," and his address will be followed by the reports of the association's Diet Therapy Section. Special group dinners are being planned for Tuesday evening, and it is suggested that anyone who wishes to sponsor a group should write to the program chairman. Among the group topics already suggested are the school lunch, food clinics, state and county hospitals, children's hospitals, dietitians teaching medical or dental students, dietitians teaching nurses, consultant dietitians and dietitians in public health work.

A luncheon will be held for presidents of state associations on Wednesday noon, sponsored by Anna Tracy and the incoming president-elect.

A new departure in the annual programs of the national association will be a questions and answers program on Thursday morning, with Dr. Mary de Garmo Bryan as leader.

Leaders in the field of education representing Milwaukee's well-known schools and colleges will also appear on the program.

An invitation has been extended members of the American Dietetic Association by the Mayo Clinic to visit Rochester on Saturday, October 15, when visitors will be conducted through the Clinic and invited to a luncheon at one of the city's hotels.

Further details, including a tentative program, will appear in the August-September JOURNAL.

While the general sessions and section meetings are always the main features of an annual meeting, Milwaukee itself is desirous of making the 1938 meeting one long to be remembered. On Sunday, October 9, there will be the welcoming tea to all members, which will be held at the Milwaukee Children's Hospital Convalescent Home, an attractive colonial building situated in the rolling prairie section of Waukesha County. It is a short drive from Milwaukee. Here on Sunday afternoon from four to six P.M., the Milwaukee and Wisconsin Dietetic Associations are to be hostesses. Free transportation from the Schroeder Hotel will be provided for all guests.

Thursday, October 13, has been designated as Milwaukee Day. At a 11:45 A.M. luncheon meeting, Ada Lothe, honorary president of the Wisconsin Dietetic Association, will preside. Mr. Wm. L. Coffey, manager, Milwaukee County Institutions, will give the leading address, "Commissary System of Relief." Susan West, Milwaukee Downer College, Sister Mary Albert, Mount Mary College, Elizabeth Tonnigan, Milwaukee Vocational School, and Theresa Goetz, Veteran's Administration Facility, will speak concerning their respective institutions.

Three main trips of interest have been planned for Thursday afternoon. Trip No. 1 will include the Milwaukee County Commissary and a tea at Milwaukee County General Hospital. At the latter, one may see hospital kitchens noted for their efficient equipment.

The second trip will be to the new and ultra-modern bakeshop at the Veteran's Administration Facility, and then to tea at Mount Mary College.

The third trip will be to Milwaukee Vocational School, outstanding in the United States for its work in adult education. This trip will be followed by tea at the new Chapman Library at Milwaukee Downer College.

The Milwaukee Day dinner will complete Thursday. It will be held in traditional German style in the historic Wisconsin Club.

Short trips are also being planned for other days. Sightseeing, hotel and restaurant kitchens, home service departments, the utility companies, newspapers and public buildings, will be points of interest.

An alternate trip to be offered on Friday for those who are unable to go to Madison will include the Carnation Milk plant in Oconomowoc, and the Brookhill Certified Milk Farm at Genesee Depot.

Notice: Heads of Approved Training Courses for Student Dietitians. According to Dorothy I. Lenfest, business manager of the A.D.A., there are a number of students who meet the requirements for training who have not yet received appointments. Miss Lenfest suggests that all department heads who have vacancies occurring in the summer write to her at 185 North Wabash Avenue, Chicago, for the credentials of the students.

American Home Economics Association Program for Annual Meeting, Pittsburgh, June 28-July 1. Between two and three thousand home economics women will gather in Pittsburgh at the 31st annual meeting, to discuss problems ranging from the federal low-cost housing program, public health, and educational objectives, to school lunch projects, consumer education, and family nutrition. Interspersed with such subjects of practical interest to homemakers as grading and informative labeling of foods, specifications for textiles and household equipment, and family health and nutrition, will be discussions of education for family living in a democratic society, pending legislation affecting home and schools, utilizing home economics in social welfare and public health work, and effective consumer organization. Speakers will include Bleeker Marquette, Catherine Bauer, Dr. Louise Stanley, Mrs. Della T. Lutes, Dr. Day Monroe, and Dr. Pauline Beery Mack.

Mary Hemmersbaugh, chairman of the Home Economics Administration Section of the A.H.E.A. announces the following section program of particular interest to dietitians: June 29, morning meeting, Lillian Williamson, instructor in institutional administration, Baldwin-Wallace College, "Cooperative Plan of Living in Residence Halls"; S. Margaret Gillam, director, Department of Nutrition, New York Hospital, "Graduate Training and Internship for the Hospital Dietitian"; Winning Pendergast, assistant director, Board of Education, Detroit, "Prerequisite Training and Internship for the School Cafeteria Director"; Mr. Pliny H. Powers, superintendent of schools, Youngstown, Ohio, "The School, the Director, the Administrator"; and Neva Henrietta Radell, assistant professor of business administration, Adelphi College, "Personal Accounting".

At the luncheon on June 30, Mary C. Kelly, cafeteria director, Hartford Public Schools, will preside, with the following program: Mrs. Bessie Brooks West, head of institutional economics, Kansas State College, "Present Administrative Policies Regarding School Cafeterias"; Mr. D. E. Montgomery, director, Consumers' Council, Agricultural Adjustment Administration, Washington, D. C., "Available Federal Grading Services"; and Mr. Frank C. Moore, director of industrial arts, Board of Education, Cleveland, "The School Cafeteria—Why?"

Mary Hemmersbaugh, supervisor, Division of School Lunchrooms, Cleveland Board of Education, will preside at the afternoon meeting, with the following speakers: "Ruth Graves Wakefield, Toll House, Whitman, Massachusetts, "Good Food, Attractively Served"; Marie L. Casteen, director of the experimental kitchen, the Statler Hotels System, New York City, "Tested Recipes for Better Food"; Mr. Owen T. Webber, Allegheny Steel Company, Breckenridge, Pennsylvania, "Highlights in Equipment Construction"; and Helen Petry, director of lunchrooms, Hanover Township Schools, Ohio, "Food for Health in the School Cafeteria".

American Public Health Association announces the awards for the 1937 City Health and Rural Health Conservation contests. These contests are conducted annually and awards given in each of the six population groups. The awards are not for the healthiest cities but are given for the most effective efforts to meet local health problems, or in other words, efforts representing community-wide action of all agencies and groups including private practitioners of medicine and dentistry. Some of the

activities considered are safety of water supply, adequate sewage disposal, supervision of milk supply and medical and nursing service, with special emphasis on school health and control of tuberculosis and venereal diseases.

Boston received the award in group 1; Louisville, group 2; Hartford, Conn., group 3; Sacramento, group 4; Greenwich, Conn., group 5; Englewood, N. J., group 6.

In the Rural Health Conservation contest, financed by the W. E. Kellogg Foundation of Battle Creek, Michigan, Columbia County, New York, won for the northeastern division, Fayette County for the eastern, Pike County for the southeastern, Woodbury County, Iowa, for the north central, Amarillo-Potter County for the south central, and Callam County, Washington, for the western.

Conference of Food Service Directors. The fourth annual conference will be held in Rochester, New York, November 4–5. Other conferences have been held in various sections of the country and have met a real need. They are sponsored by members of the American Dietetic Association and the American Home Economics Association.

The Program Committee under the leadership of Laura Comstock is preparing a series of addresses and discussions of special interest to administrative dietitians, restaurant and school lunchroom managers. The tentative program includes personnel training, problems in equipment and layout, food management and financial administration. Special attention is to be given to research reports on topics under study since the annual conference in Boston last autumn. Among the prominent speakers will be the following: Mary McCormick, New York State Department of Education; Dr. Estelle Hawley, University of Rochester; and Dr. Lydia Roberts, University of Chicago.

There will be an opportunity for interesting side trips and visits to restaurants, hotels, school lunchrooms and hospitals of the city. Other points of interest include the Eastman Kodak Company and the University of Rochester.

The Hotel Seneca is to be headquarters while the Sagamore, Powers, and Rochester hotels are also convenient. Reservations should be made early. Etta H. Handy, University of Rochester, is chairman of the Publicity Committee.

Canadian Dietetic Association is holding the annual meeting at the Chateau Laurier, Ottawa, June 13–15. Among the speakers will be Marie Casteen of the Statler Hotels System, New York, and Mr. Charles Fuller-Stoddard of Butler Hall, Columbia University, who will preside at a session for dietitians in commercial work. Mrs. George Black, M.P. for Yukon, will be the guest speaker at the Exhibitors' Luncheon, and Dr. Douglas Taylor of the Royal Victoria Hospital, Montreal, Dr. George F. Williams of Ottawa, and Dr. E. R. Thompson of McGill University will be among the medical speakers. A cordial invitation is being extended to members of the A. D. A. to attend this meeting.

The New England Health Education Association held their 12th Annual Conference June 3–4 at the Pratt Building of Naval Architecture, Cambridge, Massachusetts. Speakers included the following: Ruth E. Grout, director of health education study, Cattaraugus County School Health Service, Olean, New York, "School and Community Cooperation in a Health Program"; Mr. Homer N. Calver, director of health exhibits, 1939 New York World's Fair, and secretary and director, committee on American Museum of Hygiene of the American Public Health Association, "The American Museum of Hygiene and the Health Exhibit of the 1939 New York World's Fair"; Ruth Evans, assistant supervisor of health and physical education, public schools, Springfield, Massachusetts, "Building a Health Curriculum in Springfield Schools"; and Mr. Payson Smith, Graduate School of Education, Harvard University, "Health Phases of Recent Studies and Surveys in Education".

Other speakers during the meetings of the past year included Mary Pfaffmann of the Boston Dispensary, who discussed "Our Most Successful Exhibit and Why"; and Margaret Riley, discussion leader on "The Malnourished Child".

Assistant Editor of the Journal Marries. Colleen Cox, formerly of the Memorial Hospital, Cumberland, Maryland, was married on April 16 to Mr. Richard W. Hambleton of Baltimore. Mrs. Hambleton has resigned her position at the Memorial Hospital and has accepted another as ward dietitian at the Johns Hopkins Hospital,

beginning June 1. She will continue as assistant editor of this JOURNAL.

A Dietitian Builds Her Own Business. Clementine Paddleford, food columnist for the New York *Herald Tribune*, recently commented on a business venture conducted by Eleanora Sense, vice-president of the Greater New York Dietetic Association and editor of the New York State Dietetic Association's *Bulletin*. Miss Sense, who holds the degrees of B. S. and M. S. from the University of Wisconsin, is marketing tea and cocktail cookies and appetizers in several of the fine food shops of New York City. Using as a foundation a French cooky recipe brought to this country over 100 years ago, Miss Sense improved the original recipe, insisted upon glass packaging, took a course in art work in order to design a decoration for the jars, and has built a spare-time enterprise to a full-time, prosperous business. Miss Sense has now added five additional appetizers, namely, Rum Nuts, Soy Nuts, Faintly Sweet, a cracked wheat concoction for the calorie counters, and a delicious toasted almond mixture. In this varied selection a satisfactory accompaniment can be found for cocktails, sherry, champagne, or afternoon tea.

Pellagra Investigations. Jean Grant has been at the Hillman Hospital, Birmingham, since February, assisting Dr. Tom Spies in a study of the pellagra-preventive value of nicotinic acid. The investigations will probably continue until July.

A Set of Tabular Material for Food Scoring. Frances L. Hoag, chairman of the Community Education and Nutrition Section of the Pennsylvania Dietetic Association, announces that a set of seven sheets, a wall chart and an 8-page pamphlet of instructions on the above suitable for teaching food scoring, are available, postpaid anywhere in the United States, for 40 cents. Quantity rates will be given upon request. This material may be obtained from the Philadelphia Dairy Council, 20th and Race Streets, Philadelphia, or through local dairy councils. Each sheet contains 16 scores of foods accompanied by food illustrations and may be cut apart for use as individual food scoring cards, colored or not, as desired. The wall chart shows the contribution which milk makes toward meeting the daily food needs. The material is suitable for use from the elementary school level through college, and for adult groups of all types. Dr. Mary Swartz Rose refers to this material on page 183 of her current edition of *The Foundations of Nutrition*.

Radio Broadcasts. The New York Home Economists in Social Work are continuing their program on which comment appeared in this JOURNAL for May. The following topics were presented during May and June: "The Home Training Table", May 19; "Little Economies", June 2; "Moth Control", June 16. The final program of the series, on the subject of refrigeration, is to be presented June 30. Another series is being planned for future presentation.

Walker-Gordon Laboratory Co. Inc., Plainsboro, N. J., announce the appointment of Elsie Strahan as director of the Walker-Gordon Gate House, effective April 1, 1938. The Gate House is at the entrance to the Walker-Gordon Farm on United States Highway No. 1.

High School Students Write Up Pittsburgh Hospitals. A recent issue of *West Penn News* contained articles on all hospital departments of the Western Pennsylvania and Allegheny General Hospitals, written by students in Pittsburgh high schools. The write-up of the dietary department, particularly regarding the purchasing of food and supplies, by these students, might well serve as a model for older journalists. Other discussions by the students, of particular interest, were those concerned with the children's ward, the management of newborn babies and an outline of the nurses' duties for the day.

Mrs. Beth Bailey McLean, supervisor of home economics for Swift & Company, invited several guests to a springtime luncheon presenting a new development in Swift's premium ham at the Perroquet suite of the Waldorf Astoria hotel, New York City, April 18.

Golden Gate International Exposition. The use of the daphnia as the ideal test animal will be one of the unusual exhibits in the Hall of Science Medical Exhibit at the 1939 exposition

on San Francisco Bay. Through the use of motion pictures the Biological and Biochemical Research Laboratory of the Philadelphia College of Pharmacy and Science will show the reactions of these organisms to drugs. As the daphnia magna, a transparent crustacean, possesses well-developed muscular, nervous and glandular systems, it serves as a remarkable test-animal for the detection of the presence or absence of substances affecting the cells or organs of these systems. In view of the fact that daphnia responds not only qualitatively but also quantitively to medicinal products, added in therapeutic, toxic, critical and fatal doses, it permits the study of the physiological mechanism of drug action and aids the study and evaluation of a great variety of active substances.

Size as a Critique of Good Physical Development. The *American Journal of Pharmacology* for March 1938 publishes an article by T. Swann Harding, entitled "Are We Elephants or Men?", and questioning whether nutritional standards designed to accelerate growth are beneficial.

Famous New England Dishes. Helen S. Kintzing, director of home economics for the National Biscuit Company, has just released a folder of recipes with the salty flavor of the New England coast, in which she has cleverly incorporated Kennedy's Special Commons, a product of the National Biscuit Company.

California Dietetic Association. Edith Yokela, who for the past two and one-half years has been assistant dietitian at the Samuel Merritt Hospital in Oakland, has resigned to take a position at the Veterans' Hospital in Tucson, Arizona. Dorothea Davis, a recent graduate of the Alameda County course, has replaced Miss Yokela at Oakland.

Mrs. Julia Reardon, who was the first graduate of the Alameda County Course for Student Dietitians in 1927, and who for the past nine years has been dietitian at the Arroyo Sanitorium in Livermore, resigned November 1. Mrs. Reardon expects to retire from active duty and spend her time traveling.

Elizabeth Frey, a graduate from Alameda County Hospital is assistant dietitian at the Children's Hospital in San Francisco. This position was newly created.

Another dietitian was added to the staff of the Alameda County Hospital in October. The place is being filled by Gertrude Lauche, who has had a federal position in California. Previously, for ten years Miss Lauche was chief dietitian at the Cincinnati General Hospital.

Viona Ramelli, following temporary work in the Dietary Department of the Franklin Hospital, San Francisco, has accepted a permanent position as dietitian at the Health Cottage on the San José College campus.

Virginia Pierce is now chief dietitian at the Cottage Hospital in Santa Barbara. Miss Pierce was formerly at the Dameron Hospital in Stockton. Mary Hanley succeeded Miss Pierce at the Cottage Hospital.

Mrs. Ouida Waltmann, who for three years held the position of chief of the Dietary Department at the Children's Hospital, San Francisco, has resigned her position. Mrs. Gwen Wedlake, formerly assistant, was promoted to the position vacated by Mrs. Waltmann, and Ruth Beattle of Stanford Hospital replaced Mrs. Wedlake.

Lillian Anderson filled the vacancy created by the resignation of Julia Reardon at the Arroyo Sanatorium, Livermore. Miss Anderson is interested in the sanatorium type of dietetic management, having been previously employed at the Weimar Sanatorium. She will be in full charge at Arroyo.

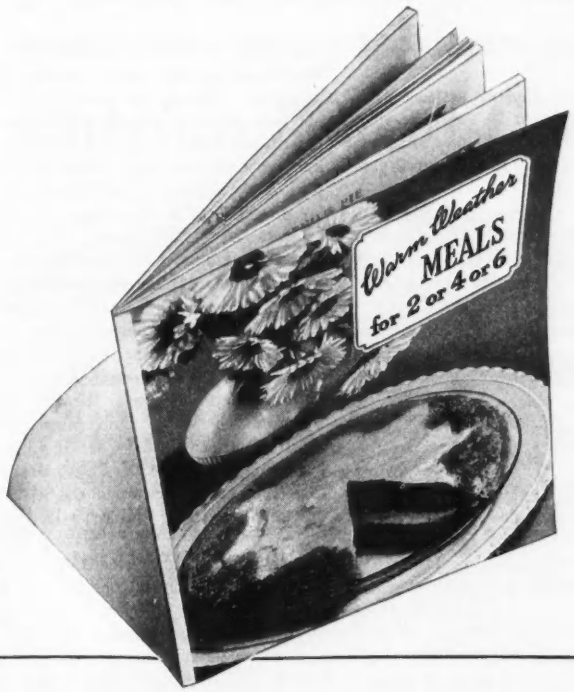
Mrs. Barbara Reed Robson of Berkeley is now working with the Dole Company. The new pineapple recipes which she is developing are unusually good and much appreciated.

California dietitians entertained Dorothy I. Lenfest at a dinner on Sunday, April 3.

Detroit Dietetic Association held its February meeting at the "Hospitality Center" of the Detroit Dairy and Food Council in the New Center Building. The meeting was sponsored by the Diet Therapy Section. Dr. J. A. Johnston, head of the pediatric staff of the Henry Ford Hospital, spoke on "Factors Effecting Utilization of Food".

The March meeting was held at the Women's City Club, a buffet supper preceding the meeting. Dr. Helen A. Hunscher, director of the Home Economics Department of Western Reserve University, spoke on "Challenge in Cleveland".

Gertrude Stone, a former student at Harper



"Warm Weather Meals for 2 or 4 or 6" is a carefully selected collection of tested recipes—illustrated with photographs and made more helpful with explanatory notes and balanced menus—which demonstrates how appetizing and delicious food can be made more wholesome and, at the same time, cost less with Irradiated Pet Milk.

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Hospital, is now nutritionist at the city physician's office.

Enid Everson Booth, dietitian at Wyandotte General Hospital, resigned in February. Lavonne Lindquist, formerly of Greeley Hospital, Greeley, Colorado, is now dietitian at Wyandotte General Hospital.

Marguerite Anacker, formerly of the Milwaukee Hospital, is now the administrative dietitian at St. Mary's Hospital.

Sister Mary Elizabeth Fey is now assistant dietitian at St. Mary's Hospital.

Mary Jordan Spilman is taking the student training course in school lunchroom management given by the Detroit Board of Education.

Florida Dietetic Association. The fourth annual meeting was held May 8–9 at the McAllister Hotel, Miami. The meeting opened Sunday with a beach party and supper. Jennie Tilt presided at the business meeting on Monday morning. Miss Tilt, as member of the House of Delegates for the Florida association, reported on the first meeting of the House of Delegates.

Anna Tracy, president-elect of the American Dietetic Association, and Helen Batson, chairman of the state Professional Education Section, were in charge of the second morning session. At the luncheon meeting, with Meredith Dupuis presiding, greetings were extended by Dr. Woodward of the Jackson Memorial Hospital, Miami, followed by a paper on "Tropical Fruits" by Dr. John C. Gifford of Miami University. The afternoon session presented the following program with Anna Mae Sikes presiding: "Nutritional Factors in the Problem of Dental Caries", Dr. Marcus F. J. Weilage, Miami; "Diet in Tuberculosis", Dr. D. Thompson, State Tuberculosis Sanatorium, Orlando; and "Clinical Manifestations of Low Blood Sugar Levels", Dr. J. L. Anderson, Miami. Dr. John Harvey Kellogg was the speaker at the annual dinner.

The following officers were elected for the ensuing year: president, Pearl Laffite, Duval County home demonstration agent, Jacksonville; vice-president, Helen Davis, dietitian, State Tuberculosis Sanatorium, Orlando; secretary-treasurer, Agnes Sawby, dietitian, Flagler Memorial Hospital, St. Augustine; and member, House of Delegates, Jennie Tilt, Florida State College for Women, Tallahassee.

Georgia Dietetic Association. The fifth annual meeting was held in the Georgian Terrace Hotel, Atlanta, on April 22. Jennie Tilt of Florida State College presided at the School Nutrition Section, held jointly with the American Association of Health and Physical Education, on the morning of April 22, with the following program: "The Organization of the Health Education Program in the School", Eleanor Green, Florida State College, Tallahassee; "The Contribution of Home Economics Teachers to the School Health Program", Katherine Ansley, executive secretary, American Home Economics Association, Washington; "The Administration of the School Lunchroom", Anna M. Tracy, Florida State College; "Health Education Through the School Lunchroom", Ethel A. Martin, National Dairy Council, Chicago; and "The Contribution of the Public Health Nutrition Program to the Health of the School Child", Marjorie Heseltine, Children's Bureau, Washington.

Peggie Newsom, president of the Georgia Association, presided at the business meeting, which was followed by a round table with Marjorie Massee as leader. Other papers presented were as follows: "Research Work at the Georgia Experiment Station", Dr. Leah Ascham, Georgia Experiment Station; "Recent Research with Irradiated Milk", Dr. Marietta Eichelberger, Irradiated Evaporated Milk Institute, Chicago; "The Contribution of the Dietitian to Nutrition Program of a Public Health Agency", Marjorie Heseltine; and "Yesterday and Today in the American Dietetic Association", Anna M. Tracy.

Kansas Dietetic Association was organized at Topeka on January 28, 1938. Seventeen members were present. Officers elected were as follows: president, Kathryn Tissue, University of Kansas; president-elect, Bernice Keim, University of Kansas Hospital; vice-president, Martha S. Pittman, Kansas State College; secretary, Gladys Beyer, McPherson County Hospital; treasurer, Frances Janda, Osawatomie State Hospital.

The state organization, with a membership of 30, affiliated with the national organization in March a few days before the first annual meeting which was held in Topeka on March 25. Guest speakers at this meeting were Josephine A.

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Marshall, president of the Kansas Home Economics Association, who pointed out some of the advantages of affiliation of closely related organizations; Mrs. Ruth Cowan Clouse, a former member of the Council of Foods of the American Medical Association, who spoke on "Recent Trends in Nutrition"; and Dr. Orval Withers of Kansas City, Missouri, who discussed "Food Allergy." Lenna F. Cooper, president of the American Dietetic Association, was the luncheon speaker, using as her subject "Cooperation Within the Association."

A vitamin symposium was held at the morning meeting with Kathryn Tissue presiding. Dr. Lillias D. Francis discussed vitamins B and G; Bernice L. Kunerth, vitamin C; and Frances Janda, "The Effect of Storage and Methods of Preparation on the Vitamin Content of Foods." At the afternoon meeting, Mrs. Bessie Brooks West spoke on "The Non-Hospital Dietitian", and Mildred Young led a round table discussion on problems of general interest to the dietitian.

Indiana Dietetic Association held its annual spring meeting April 8–9, in Indianapolis. The meeting opened with a dinner Friday evening at the Propylaeum with 76 guests present. Eleanor Irwin was chairman of the dinner committee. Members were most fortunate in having Lenna F. Cooper, national President, as speaker for the evening.

All meetings on Saturday were held at the Columbia Club. During the morning business session, at which the president, Verna McKinley, presided, reports of officers and chairmen of committees were read. Mrs. Mary D. Benham, manager of the Y. M. C. A. Cafeteria in Columbus, Ohio, discussed "Cafeteria Management". Mrs. Benham is a charter member and past president of the Indiana Dietetic Association. Another guest was Estelle Nesbitt, who has recently returned from four years at Peiping Medical College in China, where she was chief dietitian and directed a training school for Chinese student dietitians. Dr. John G. Benson, general superintendent of the Methodist Hospitals of Indiana, spoke at the luncheon on "The Art of Dietetics". Ava Martin was in charge of the luncheon.

Dr. Irvine I. Page, director of research at the Eli Lilly Company, spoke at the afternoon session on "Diet in the Treatment of Bright's Disease and Hypertension". "Recent Developments in Clinical Methods for Detecting Vitamin Deficiencies" was the subject of Dr. Cecilia Schuck, assistant professor of nutrition at Purdue University.

For the arrangement of an excellent program the association is indebted to Mrs. Maude Ashman.

The following officers were elected: president, Helen J. Schuller, Indiana University Medical Center; vice-president, Maude Ashman, Union Hospital, Terre Haute; secretary, Eleanor Irwin, Indiana University Medical Center; and treasurer, Gene Cooper, Methodist Hospital, Indianapolis.

The registration fee for student dietitians at the University of Indiana Hospitals appears incorrectly on page 370 of the November 1937 JOURNAL. This fee is $50.

Louisiana Dietetic Association. The association held its monthly meeting, January 10, at Charity Hospital, New Orleans. Janet Geister, consultant supervisor on the staff of the New Orleans Child Welfare Association, discussed "The Place of Nutrition in Child Welfare Work".

The guest speaker at the March meeting was Dr. Herbert Rothchild; his subject, "Nutrition and Infant Feeding".

Dr. I. W. Kaplan presented a paper on "Diet in Peptic Ulcer" at the April meeting held at Charity Hospital.

On May 9, the last meeting of the season was a dinner held at Corinne Dunbar's Tea Room.

Mary Brakel and Margaret Davenport, both formerly of King County Hospital, Seattle, are now at Charity Hospital as assistant dietitians.

Nadine Hartley, former dietitian at Oklahoma Baptist Hospital, is now assistant dietitian at Southern Baptist Hospital, New Orleans.

Helen Cincoski, former student of Indiana University Hospital, has a position as assistant dietitian at Charity Hospital.

Adelle Cory has accepted a position as assistant dietitian at Touro Infirmary. She was formerly assistant dietitian at Albany Hospital, Albany, N. Y.

Onida Moore, formerly dietitian at Children's Hospital, San Francisco, is now assistant administrative dietitian at Charity Hospital.

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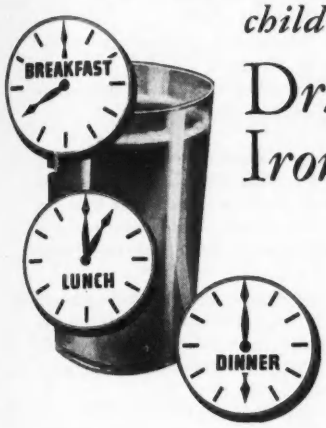

And, better yet, the 5 milligrams of Iron that they drink with each ounce-serving of Cocomalt, is "effective" Iron . . . Iron that has been biologically tested for assimilation.

In addition to that Iron, each ounce-serving of Cocomalt is *fortified* with .15 gram of Calcium, .16 gram of Phosphorus. And, insuring that these will be readily "available" to the patient, each ounce of Cocomalt also provides 134 U.S.P. Units of Vitamin D, derived from natural oils and biologically tested for potency.

Served hot or cold, Cocomalt's distinctive flavor appeals to old and young, alike. It is obtainable in ½-lb., 1-lb. and the economical 5-lb. hospital size, purity-sealed cans at grocery and drug stores.

Cocomalt is the registered trade-mark of R. B. Davis Co., Hoboken, N. J.

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TO NURSES AND HOME ECONOMISTS

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Please send me FREE sample of Cocomalt.
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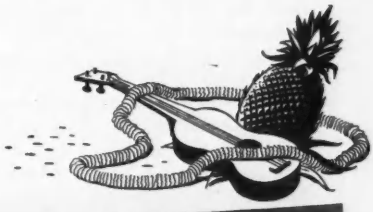
A little trick I learned in Hawaii



A clever Island hostess of my acquaintance delights unexpected guests this way: She places slices of drained Dole Pineapple* on squares of plain cake and tops them with almond-flavored meringue and chopped almonds. She toasts the squares in a slow oven. Simple and quick—but extraordinarily delicious!

**Golden rings of tender, juicy Hawaiian Pineapple. Dole Pineapple is sun-ripened to perfection and packed field-fresh.*

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RECIPE AND INFORMATION SERVICE

If you are not already receiving my recipe and information cards, send me your name and address. The cards—standard file size—contain interesting and practical recipes and important scientific information about Dole Pineapple and Pineapple Juice. They will be sent to you regularly, free of charge.

If you have any questions or specific problems you want to discuss, write to me. I'll be glad to answer you personally.

Patricia Collins
Dole Home Economist

Hawaiian Pineapple Co., Ltd., also packers of Dole Pineapple "Gems," Dole Pineapple Juice, Crushed, Tidbits, and the new "Royal Spears." Honolulu, Hawaii, U. S. A. Sales Offices: San Francisco, Calif.

Maryland Dietetic Association held the annual state convention April 22–23, at the Longfellow Hotel, Baltimore. The convention opened with a banquet Friday evening, at which Marguerite Betts, president, acted as toast-mistress. Mrs. Louisa Pryor Skilton, editor of *American Cookery Magazine*, was the guest speaker; her subject, "Interpreting Dietetics with a Human Touch", was delightfully presented.

The Saturday sessions began with round table discussions, led by the following section chairmen: Administration, Kathleen Lewis; Professional Education, Mrs. Ethel Gardner; Diet Therapy, Helen Baughman; and Community Education, Mrs. Alice Lambert.

At the business session, with Helen Schmit, vice-president, presiding, Marguerite Betts opened the meeting with an address of welcome. Dr. E. V. McCollum of the School of Hygiene of the Johns Hopkins University reported on the work done by the Committee on Nutrition of the League of Nations, which met in London, England. Dr. McCollum suggested that the various publications of the League of Nations on the subject of nutrition could be obtained by writing to the International Document Service of the Columbia University Press, New York. Dr. Georgian Adams, associate specialist in foods and nutrition, Bureau of Home Economics, reported on the work of the bureau, discussing chiefly food composition and analysis.

The convention closed with a luncheon at which Mr. Don Swan, the Baltimore etcher, discussed "Old Maryland Homes" and Mr. Folger McKinsey, a Maryland poet, interpreted some of his poetry.

Dr. Ernest Gaither, head of the Genito-urinary Clinics of the Johns Hopkins Hospital, discussed "Recent Concepts of Dietary Treatment in Genitourinary Conditions" on April 21 at a meeting arranged by the Diet Therapy Section.

Members of the association were guests of the Maryland Hotel Supply Company and the Bird's Eye Frosted Foods Corporation at a dinner at the Emerson Hotel, Thursday, April 7.

Martha Trulson resigned her position as assistant dietitian at the Union Memorial Hospital, Baltimore, to join the staff at the University of Chicago Clinics.

Mrs. Laura Robeson has recently accepted the position of head dietitian at the Women's Hospital of Baltimore.

Margaret MacDonald, a graduate of the Michael Reese Hospital, Chicago, has been assigned as relief dietitian at the Johns Hopkins Hospital.

Massachusetts Dietetic Association is proud to announce that a refresher course for dietitians was held May 23–28, with Gertrude Spitz as director. More detailed information about the course will be found in the next issue of this JOURNAL.

Mr. Edward Gallagher, assistant manager of the Boston Better Business Bureau, was the speaker at the annual dinner meeting of the association held at the Women's Educational and Industrial Union, April 5.

The Peter Bent Brigham Hospital celebrated its twenty-fifth anniversary May 5–7. Among the many interesting papers presented was one by Gertrude McDonald on "Judging the Adequacy of Diets".

Quindara Oliver Dodge spoke on "Professional Progress" at the annual meeting of the Texas State Dietetic Association held at Houston in April.

Mary Spalding, nutrition consultant, Massachusetts Department of Public Health, recently went to Washington for an advisory committee meeting called by the Federal Surplus Commodities Corporation. The conference was attended by officers of the corporation, representatives of the Independent Grocers' Alliance of America and the National Association of Food Chains, the California Commissioner of Public Welfare, and five home economists.

Olive Holman has resigned as assistant dietitian at the Massachusetts Eye and Ear Infirmary to become therapeutic dietitian at the Cambridge Hospital, Cambridge.

Hermaline Gage has accepted a permanent position on the staff of the Presbyterian Hospital, New York City.

Dorothy Frank, nutritionist with the Massachusetts Department of Public Health, was recently married to Mr. Sidney Adolf.

Blanche Collier has moved to Urbana, Illinois.

Miriam Perry, formerly administrative dietitian at the Boston Dispensary, is now attached to the staff of the Walter Reed Hospital.

2 SIMPLE WAYS

of Preparing Palatable High Concentrations of KNOX GELATINE

PHYSICIANS are constantly asking us for formulae for the preparation of Knox Gelatine in a concentrated palatable form, useful in the dietary treatment of such conditions as muscle fatigability and gastric ulcer. Research on such formulae has shown these to be excellent.

"The Knox Milk Stir"

Place the contents of 4 envelopes of Knox Gelatine in an ordinary drinking glass. Add 4 ounces of cold milk and allow to soak for five minutes. Add 2 more ounces of milk and stir until thoroughly soaked. Then place glass in small cooking kettle of hot water until gelatine milk mixture is thoroughly dissolved. Add 2 more ounces of cold milk, which will bring the temperature to a satisfactory warm drink of about body heat. A tablespoonful of prune juice or a few drops of any bland flavor like vanilla may be added.

Total: 8 ounce liquid—about 250 calories

"The Knox Fruit Stir"

Place the contents of 2 envelopes of Knox Gelatine in an ordinary saucer or cereal dish. Add 8 tablespoonfuls of any desired fresh or canned fruit juice, such as grape juice. Let soak for five minutes and eat with teaspoon.

Total: 4 ounce mixture—about 100 calories

They are ideal when frequent feedings and extra calories must meet adequately the level of nutritive requirement. Indicated to allay the pain in the gastric ulcer patient when given hourly. An adequate food adjunct both from the standpoint of easy digestibility or "low residue" in gastro-enteric dysfunction or intestinal stasis. Also of value for their high amino-acetic acid (glycine) content in dystrophic muscular conditions.

Write Dept. 466 for Sample and Dietary Booklets.

Why You Should Insist on Knox Sparkling Gelatine

Because Knox Gelatine is 85% protein in an easily digestible form—because it contains absolutely no sugar or other substances to cause gas or fermentation, Knox Gelatine should not be confused with factory-flavored, sugar-laden dessert powders. Knox is 100% pure U.S.P. gelatine. Knox Gelatine has been successfully used in the dietary of convalescents, anorexic, tubercular, diabetic, colitic, and aged patients.

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IS PURE GELATINE—NO SUGAR

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Louise Hatch, formerly a student at Beth Israel Hospital, and recently at Cornell Medical Center, is now dietitian at the Framingham Hospital.

Ruth Connolly, who has completed her student course at the Peter Bent Brigham Hospital, will begin her duties September 1 at St. Joseph's Mercy Hospital, Detroit.

Edith Taub, a recent graduate of Michael Reese Hospital, is now assistant dietitian at Beth Israel Hospital.

The April meeting of the Child Hygiene and Public Health Nursing Section of the Massachusetts Health Association was attended by a large number of nutritionists who heard Dr. Harold Stuart, assistant professor of Child Hygiene and Public Health, Harvard School of Public Health, discuss "The Outlook for an Appraisement of Nutrition." He advocated a good physical examination, certain laboratory tests, and a nutrition history taken by an expert in this appraisement. Bertha S. Burke collaborated with Dr. Harold Stuart in the April issue of the *Journal of Pediatrics* in an article on the method of diet analysis used at the Center for Research in Child Health and Development, Harvard School of Public Health.

Many members of the association attended Dr. Henry C. Sherman's lecture on "Toward Optimal Nutrition" at the Massachusetts Dental Society meeting and also the open nutrition forum led by Dr. Sherman and Dr. Percy R. Howe, with Ruth L. White as chairman. Miss White recently spent a week in Vermont participating in refresher courses for dentists. Ailenne Tolbert resigned from the Burbank Hospital, Fitchburg, to be married. Her position was filled by her assistant, Hildegard Osterlund, and Mary Silliman was appointed as assistant.

At the Boston University School of Education this summer, Fredericka Beinert will teach a survey course on recent advances in nutrition and their interpretation to the family and the individual.

Mary Casey is now at the Portsmouth Hospital, Portsmouth, New Hampshire.

Alice Van Dyke is now dietitian at the Heywood Memorial Hospital, Gardner, Massachusetts.

Frances Hoigan, Boston City Hospital, exhibited and discussed breads of various nationalities at the April meeting of the Social Workers' Section, New England Home Economics Association.

At the request of the school superintendents of Barnstable County, an institute for lunchroom managers was held concurrently with the Old Colony Superintendents' Association spring meeting. The lunchroom facilities of the new school building in Harwich, in which the institute was held, were available for the institute. Catherine Leamy, Massachusetts Department of Public Health, is conducting a nutrition demonstration in this county.

Minnesota Dietetic Association held its annual business meeting March 28 in the Faculty Room of Millard Hall on the University of Minnesota campus.

A unanimous vote in the affirmative was recorded for the revision of the constitution, permitting dues to be raised to $1.50. A Food Fad exhibit was presented and plans for continuing work on the exhibit were discussed and approved.

The annual dinner was held at the Women's City Club, St. Paul, April 25, with Lucile Townsend presiding. As a surprise number, a culinary court was held, the contestants being the outgoing officers of the association and the incoming officers. The prize was won by the incoming treasurer, Elizabeth Schofield. Two colored films followed, one of the birds of Minnesota, the other of Arrowhead County and the Gunflint Trail in Minnesota. A sound picture, "The Plow that Broke the Plains" was then shown. The place cards were booklets giving the program, officers and dinner menu, and a map of Minnesota showing locations of members. Students at Ancker Hospital, under the supervision of Lorene Kulas, made the favors which were miniature dietitians, gowned, capped and spectacled.

The following officers were elected: president, Mary Foley, Mayo Clinic, Rochester; vice-president, Hazel B. Brown, Vocational Hospital, Indianapolis; treasurer, Elizabeth Schofield, Miller Hospital, St. Paul; corresponding secretary, Louise Esch, St. Mary's Hospital, Rochester; and recording secretary, Chrissa Wendt, St. John's Hospital, St. Paul.

Lorene Kulas and Ethel Gough, as social and program chairman, respectively, were responsible for the success of this meeting.

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Consider what you pay for the ingredients needed for shortcake. Compare the total with the cost of the baking powder . . . only 2½¢ worth of Royal for 25 portions of shortcake!

Amazingly little, isn't it, for the delicate flavor and finer texture you get with Royal . . . the assurance that you'll have no trace of unpleasant baking-powder taste?

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Royal never leaves a Baking-Powder Taste

Made with Cream of Tartar—a pure fruit product—Royal assures delicious flavor in all baked foods

A LIGHT TOUCH and careful handling will assure you a *tender* shortcake. But no skill can cover up an inferior flavor. The slightest trace of baking-powder taste is sharply noticeable.

Why take chances when there is a certain way to assure a sweet, delicate flavor? Use a Cream of Tartar baking powder—Royal—and you need never worry about baking-powder taste. Cream of Tartar is a natural fruit product. It comes from luscious, ripe grapes. You can depend on it for perfect flavor—*every time.*

REMEMBER, Royal is the only nationally known baking powder that contains Cream of Tartar. Don't risk costly failures with cheap, doubtful baking powder. When you order, specify ROYAL.

ROYAL is the only nationally known baking powder made with Cream of Tartar—a pure fruit product from luscious, juice-heavy grapes.

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The May meeting was held jointly with the Minnesota Hospital Association on May 20.

Mrs. Janet Cole McGee resigned as nutritionist for the County Welfare Board of St. Paul. Alberta Gurtler has replaced Mrs. McGee.

Frances Sederberg who recently completed the postgraduate course at Ancker Hospital, is doing temporary work for the Kahler Corporation at Rochester.

Mary Silliman resigned from the Kahler Corporation and is now working in Massachusetts.

Margaret Drew is relief dietitian at the Rochester Diet Kitchen.

New Jersey Dietetic Association. Members and their friends were guests of the dietitians of Cooper Hospital at a tea held on March 31. The Administration Section held a "Food Parade" at the Presbyterian Hospital in Newark. Members brought sample dishes and recipes. The recipes were exchanged and will be tested by other members. Winifred Cushing was chairman of the evening.

The association met on April 28 at the Hackensack Hospital. Following the business meeting, papers were presented by members of the association as follows: "Government Grading and Standardization of Food", Margarita Moos, Somerset Hospital, Somerville; "Recent Books on Food, Nutrition and Institution Administration", Jane Spinelli, All Souls Hospital, Morristown; "The Dietitian and Modern Trends in Diet Therapy", Beatrice Goldstein, Beth Israel Hospital, Newark; and "Seeing Labrador with a Packard", Asta Low Packard, Somerville. A dinner was held in the evening with Mrs. Mary Stone Conklin, on "What the Dietary Department Means to the Hospital Superintendent" and Dr. Hornell Hart, professor of social ethics of Hartford Theological Seminary, as speakers.

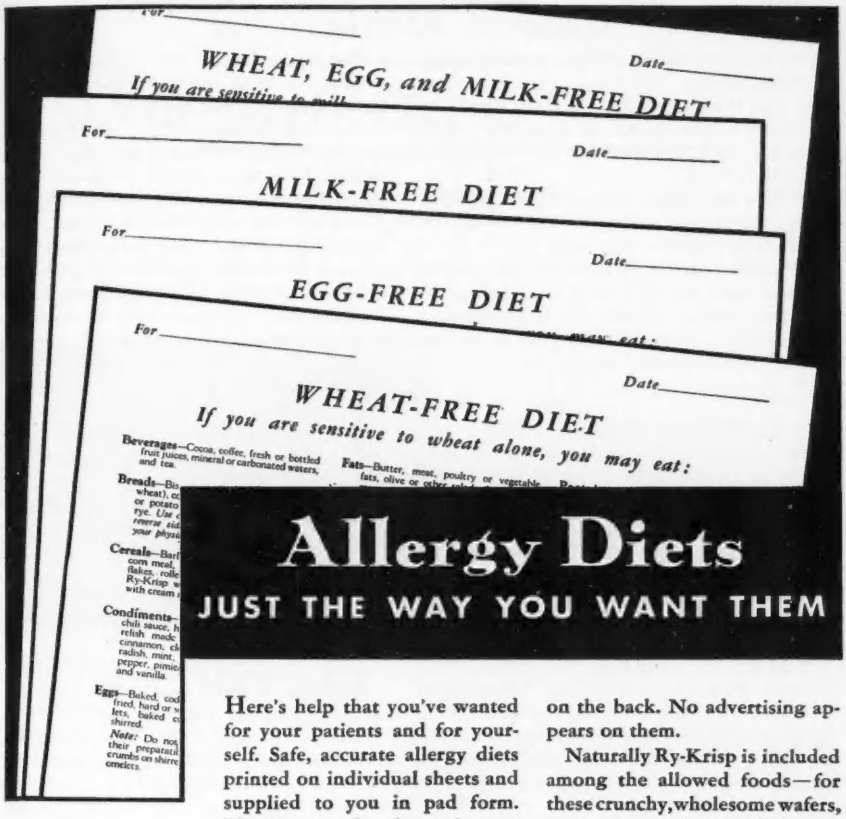
Greater New York Dietetic Association. In March a joint dinner meeting was held with the home economics association at Schrafft's with Dr. Hazel Stiebeling, senior food economist of the Bureau of Home Economics as guest speaker. Dr. Stiebeling discussed "Adequacy of American Diets", a report of a completed survey conducted by the Bureau of Home Economics with the aid of affiliated agencies. Dr. Stiebeling believes that if there were adequate distribution of foods in the states so that each family could have its correct diet, economic limitations would not form such an impassable barrier. It was found that as the income of the family increases, the percentage spent on food decreases. This is as true in cities as in villages. It was found that in New York City a lower percentage was spent on vegetables than by the families on the Pacific coast. Most of the diets of city families were found to be inadequate in minerals, while diets of farm families were inadequate in vitamins. Families on limited incomes, especially, need instruction in planning adequate diets.

At the April 11 meeting, Dr. Wilson G. Smillie, Cornell University Medical College, spoke on "Public Health Problems in Nutrition" and Mr. Paul Fahrney, controller, Presbyterian Hospital, discussed "The Dietitian and the Accountant".

The Administration Section met on April 25 at the Einhorn Auditorium of the Lenox Hill Hospital, with Elizabeth Cole, presiding, and the following program: S. Margaret Gillam, New York Hospital, "The Dietitian and Her Job; Adeline Wood, Mt. Sinai Hospital, "Exchange of Ideas"; Mr. Henry Hansi, chef, Aldene Club, "How A Chef Uses Recipes"; Bertha Nettleton, General Foods, "Pitfalls in Calculating Quantity Recipes"; and Doris Tisdale, Standard Brands, "Terminology in Food".

The annual business meeting was held May 9 Election of two officers, president and treasurer, and a nominating committee was held. Elizabeth Cole, assistant dietitian at Montefiore Hospital is the new president, and Bertha Ashley, head dietitian, St. John's Riverside Hospital, Yonkers, is the new treasurer. The two retiring officers are Louise Stephenson, Presbyterian Hospital, who has served as president for two years and Jean Sackrider, Brooklyn Bureau of Charities, who served as treasurer for two years. Officers' reports and reports from the various section chairmen were given. Among the guests were Lenna Cooper, Montefiore Hospital, president of the American Dietetic Association; Emma Feeney, retiring president of the New York State Dietetic Association; Win Cooper, dietitian, of London, England, who is studying dietetic problems at various hospitals in the United States; Lisa Timar, dietitian, of Hungary, who is doing postgraduate work at Columbia University; and Eleanora Sense, editor of the *Bulletin* of the New York State Dietetic Association.

Winifred Conwell has taken a position with



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Here's help that you've wanted for your patients and for yourself. Safe, accurate allergy diets printed on individual sheets and supplied to you in pad form. They're easy for the patient to follow—easy for you to use. All you need do is fill in your patient's name, your name and special instructions.

Prepared with the cooperation of leading specialists, these sheets list exactly what foods may be eaten and which must be avoided according to the patient's special sensitivity. Recipes are provided on the back. No advertising appears on them.

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For copies of these sheets and samples of Ry-Krisp Whole Rye Wafers, simply use the coupon.

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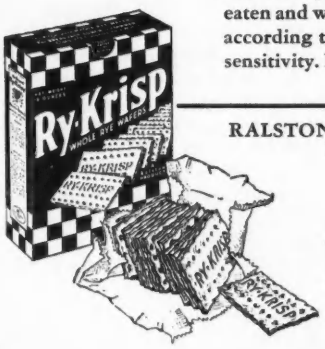

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the Park East Hospital, where she will be supervising dietitian.

Joan Rock, who has been with the Hutchinson Agency in Minneapolis, has accepted a position as the head of the Household Arts Department at Pratt Institute.

Edna Van Horn, formerly with *Better Homes and Gardens*, is working toward the doctor's degree at Columbia University.

Dorothy Stevens of Post Graduate Hospital spent two weeks in Bermuda in the spring.

Pearl Metzelthin, who has returned from a ten weeks' trip to the West Coast as dietitian for American Airways, flew 90,170 miles during the past year.

New York State Dietetic Association. The following officers for 1938–1939 were elected at the annual meeting, Syracuse, N. Y., May 5–6: President, Effie May Winger, Rochester General Hospital, Rochester; vice-president, Henderika J. Rynbergen, New York Hospital, New York City; secretary, Ethel Lewis, Highland Hospital, Rochester; and treasurer, Genevieve Moyer, Albany Hospital, Albany. The nominating committee consists of the following: Louise Schwartz, University Hospital, Syracuse; Edyth Clark, Y. W. C. A. Residence, Buffalo; Laura Comstock, Eastman Kodak, Rochester; Helen Hafner, Albany Hospital, Albany; Mary MacManus, St. Elizabeth's Hospital, Utica; and Dorothy Stevens, Post Graduate Hospital, New York City.

The convention opened May 5 with a meeting of the Professional Education Section, Henderika Rynbergen, New York Hospital, presiding, with the following program: "Psychology Applied to Dietetics", Dr. Eugene Davidoff, Syracuse Psychopathic Hospital; "Welfare as Related to the Dietitian", May C. MacDonald, supervisor, State Department of Public Welfare, Albany.

Miss Dorothea Behm, president of the Central New York Dietetic Association, presided at the Welcoming Luncheon, the guest speaker being Dean Annie L. Macleod, College of Home Economics, Syracuse.

Administration Section Reports were presented during the afternoon session, at which Ethel Lewis, Highland Hospital, Rochester, presided, and Mr. H. W. Roberts, The Colonnade Company, New York City, spoke on "Food for Thought".

The annual banquet was held at the Hotel Syracuse, with an informal address by Mrs. Della Lutes, editor and author.

The Friday morning session, Lola Heuerman, Syracuse Memorial Hospital, presiding, was as follows: "The Story Behind the Label", Mr. Carlton Sturdy, American Continental Can Company; "Low Cost Cafeteria Diets", Florence Quast, director, institution economics, Syracuse University; "Insulin Shock Treatment of Mental Disorders", Dr. L. L. Bryan, Marcy State Hospital. At the luncheon following, Dr. Helen Monsch, College Home Economics, Cornell University, discussed "The Feeding and Physical Development of the Quintuplets".

At the afternoon Community Education Section meeting Mame Porter, nutritionist, State Department of Health, Albany, presided with the following program: "Community Education", Miss Vivian Drenckhahn, Buffalo Tuberculosis Association; "Nutrition and Dental Caries", Dr. B. R. East, Vitex Laboratories, Harrison, New York.

The meeting closed with a tea given by the College of Home Economics, Syracuse University.

Oklahoma Dietetic Association. The first annual meeting was held at the Biltmore Hotel, Oklahoma City, April 29–30. Mrs. Sarah Elkin Braun, treasurer of the American Dietetic Association, was the guest speaker at the opening luncheon. The program for the first day session at which Mrs. Margaret Durrett, dietitian of the Oklahoma City General Hospital, presided, consisted of the following: "Food Allergy", Dr. Ray Balyeat; "Laboratory Tests—Their Relationship to Food Intake", Dr. Hugh Jeter; and "The League of Nursing Outlines in the Teaching of Student Nurses", Ruth Nickel, teaching supervisor, Department of Nutrition, St. Mary's Hospital, Rochester, Minnesota.

An administrative round table followed, under the direction of the chairman, Mary C. Barnes, dietitian, Oklahoma Agricultural and Mechanical College. Problems of dish breakage; control of waste; dish washing; and tray equipment and care were discussed. Mrs. Freda Schroeder Johnson presided at the dinner the same day, when Mayor Martin of Oklahoma City extended a welcome, and Dr. W. H. Miles, city health director, spoke on "Food in Public Health".

On April 30, Mary Alice Bolt, therapeutic

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Effect of Wyandotte Keego Cleaner compared with that of two other cleaners on Calcium and Magnesium in the water (hardness more than 15 grains). Note the clearness of the Keego solution.

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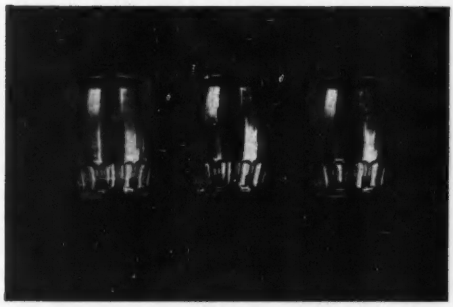
The glasses in group 2, before machine washing, were smeared with a standard grease mixture containing materials found in food products; fats, proteins, sugars and vegetable matter. The glasses were washed twenty-five (25) times, rinsed, dried, and smeared each time before next washing and final rinse.

The temperature used in washing ranged from 150–160°F., and the rinsing temperatures ranged from 170–180°F.

Note: The glass washed and rinsed with Wyandotte Keego Cleaner is sparkling clear, free from cloudiness, water marks, or foggy film.



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Let the Wyandotte Service Representative in your locality cooperate in washing dishes and glasses—without obligation to you. "Wyandotte Keego Cleaner is sold with our usual guarantee of satisfaction after a fair trial or money refunded.

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dietitian at St. Anthony Hospital, presided at the morning session with the following speakers: "Food Clinic: What is it?", Mrs. Sarah Elkin Braun; "The Physiology of Digestion—Its Effect on Diet in Health and Disease", Dr. Arthur White. The morning session closed with a Community Education round table meeting under the direction of the chairman, Mary Aiken, dietitian, Girl's Dormitory, Southwestern State Teachers College, Weatherford.

Ten exhibitors were represented at the meeting and were entertained at a luncheon on April 30. Veda Bailey presided at the Diet Therapy round table at which a panel discussion was lead by Mary Wilkinson, dietitian at the Crippled Children's Hospital. Sister Mary Margaret, chief dietitian of St. Anthony Hospital, entertained the guests at a tea in the nurses' home, followed by an inspection of the central tray service. The annual dinner with Ann Hains, president, presiding, closed the session. Following the dinner, Dr. Mark Everett, professor of physiological chemistry, University of Oklahoma, School of Medicine, spoke on "Vitamins and Clinical Medicine".

Ohio Dietetic Association met in conjunction with the Ohio Hospital Association, Columbus, Ohio, April 5–6. The main features of the program were an address by Dr. MacEachern, associate director of the American College of Surgeons; a paper on "Insulin Therapy in Mental Diseases" by Dr. Nichols Michaels of the State Hospital for the Insane; a discussion of Iowa's method of controlling its milk supply by Mr. Robert E. Neff of the University of Iowa; and a discussion of "Diabetes in Children" by Dr. Waldo E. Nelson of the Research Foundation of Children's Hospital, Cincinnati, Ohio.

Problems of affiliating state and national organizations were presented by Lenna F. Cooper, President of the American Dietetic Association. The difficulties of writing and standardizing recipes were discussed by Mary I. Barber.

The officers elected for the coming year are: Mrs. Eva Ylvisaker, president; Wilma Robinson, vice-president; Olive Walker, treasurer; and Hazel Fullreide, secretary.

The membership of the association has doubled this year through the work of Mrs. Carolyn Moorman's membership committee.

Oregon Dietetic Association. The second annual Northwest Dietetic Convention, held in Portland April 22–24, closed with a day spent at the New Timberline Lodge on the slopes of Mount Hood. Portland dietitians were hostesses to visitors from British Columbia and the states of Washington, Idaho, Utah and Montana. Mrs. Edna B. Carl, dietitian at Multnomah County Hospital, Portland, was general chairman of the convention.

Prominent speakers were: Mary W. Northrop, Harborview Hospital, Seattle, reporting the work of herself and Nena Osterud on "The Application of the Metric System in Institutional Food Control"; Melissa Hunter, director of dormitories, Oregon State College, "The Administrative Dietitian and Her Problems"; Dr. Blair Holcomb, Portland, "The Philosophy of the Diabetic Life"; Dr. R. M. Overstreet, Doernbecher Memorial Hospital for Children, "Utilization of Calcium and Phosphorus"; Dr. Margaret M. Finke, president of the Oregon State Nutrition Council, "Work of the Council"; Effie I. Raitt, director, School of Home Economics, University of Washington, "Greetings"; B. W. Fairbanks, Ph.D., nutrition scientist of the University of Illinois, "Nutrition as a Factor in Preventive Medicine"; and Jennie I. Rowntree, professor of home economics, University of Washington, "The Future of the Dietition".

A formal dinner and play, "Personal Appearance", by the Portland Civic Theater Players was held at the end of the convention at the Portland University Club.

Chairmen of the following committees were: Program, A. Jeanette Bliss, University of Washington, Seattle; Arrangements, Georgia Bibee, Oregon State College, Corvallis; Meals, Elizabeth Stewart, dietitian, Good Samaritan Hospital, Portland; General Session, Frances M. Croker, dietitian, University of Oregon Out-Patient Clinic, Portland; Publicity, Dorothy J. Keane, dietitian, St. Vincent's Hospital, Portland; and Exhibits, Elizabeth Baldwin, dietitian, Multnomah County Relief Unit, Portland.

A new food value sheet has been submitted by Lucy Reynolds, dietitian assistant to Dr. Blair Holcomb, and Frances M. Croker, dietitian, University of Oregon Out-Patient Clinic.

Frances M. Croker was elected president of the Oregon Dietetic Association. She succeeds

Rennet-Custards Excellent for Pregnancy Diets

Provide extra milk in appetizing form—easy to make

So often women rebel at the quantities of milk prescribed in pregnancy diets. Rennet-custards provide an easy way to supply this needed nourishment in an appetizing, delightful form.

These eggless rennet-custards made with "JUNKET" RENNET POWDER do not seem like milk. They have color, flavor—and are easy to make with dozens of variations. Actually more digestible than milk itself.

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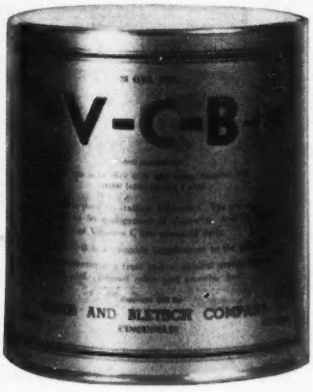
"JUNKET" RENNET POWDER
For making rennet-custards. Already sweetened and flavored. Six tempting flavors: Vanilla Chocolate Lemon Orange Raspberry Maple. Packed in cases of twelve 1-lb. or six 5-lb. cans.

"JUNKET" RENNET TABLETS
For making rennet-custards and ice cream. Not sweetened or flavored—add sugar and flavor to taste. Economical. Also makes other easily digested milk foods. Cartons of 12 packages containing 10 rennet tablets each.

"JUNKET" RENNET EXTRACT
For making rennet-custards and ice cream. Flavored, but not sweetened. Also makes easily digested milk foods. Flavors: Vanilla Strawberry Maple Orange Unflavored
Cases of 12 pint bottles.

A New Product — *Rich in Vitamin C*



Vitamin C Beverage Base

It is a well known fact that Vitamin C is a necessary part of the normal diet, and its chief sources in liquid form are Orange Juice, Grapefruit Juice, Pineapple Juice, and Tomato Juice.

V-C-B is the newly perfected Vitamin C Beverage, containing approximately the same amount of Vitamin C and caloric content as Fresh Orange Juice.

Grams of carbohydrate per 4 oz. liquid portion, 11.9 gm. Vitamin C, per 4 oz. liquid portion, approximately 50 mgm.

Test mixtures of V-C-B and Fresh Orange Juice were kept in a refrigerator for 24 hours. The fresh fruit flavor was retained, and only 5% of its total Vitamin C content was lost.

Compare the food cost of $0.016 for 50 mgm. of Vitamin C in V-C-B, to that of 50 mgm. of Vitamin C in fresh fruits or vegetables.

V-C-B is packed in 28 oz. hermetically sealed oxygen-free containers.

Sample sent on request.

Vitamin Products Division
HILKER & BLETSCH COMPANY
Chicago Cincinnati St. Louis

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Mrs. Edna B. Carl. Other officers elected were: vice-presidents, Ruby Cupper, dietitian, Benson Polytechnic High School; and Betty Dahl, dietitian, Good Samaritan Hospital.

South Carolina Dietetic Association, organized in April, 1937, held its annual meeting April 14, 1938, at the Jefferson Hotel, Columbia. Mrs. Alta C. Hamilton, chief dietitian, Columbia Hospital, presided with the following program: "The New Curriculum", Louise Strock, dietitian, The McLeod Infirmary, Florence; "Round Table Discussion of Dietary Problems", led by Lenna F. Cooper, President, American Dietetic Association; "Food Allergy", Dr. E. W. Perkins, Sumter; "Low Cost Family Budget", Ada M. Moser, president, South Carolina Home Economics Association, and home economist, Extension Department, Clemson College, S. C.; "Cuts of Meats and Ways of Preparation", Mr. Dennison, Swift and Company, Chicago.

Following a luncheon at which the dietitians were guests of the Tri-State Hospital Association, the session was resumed with a business meeting when the following officers were elected for 1938–1939: president, Edna Ward, chief dietitian, Veterans Hospital, Columbia; secretary, Nellie Turner, dietitian, Greenville General Hospital; and treasurer, Mildred Willis, assistant dietitian, Spartanburg City Hospital.

The association then met with the Tri-State Hospital Association to hear Lenna F. Cooper talk on "Administrative Problems of the Dietitian", after which the Dietary Department of Veterans Hospital was inspected, and an informal tea served by the dietary staff of that hospital.

Texas Dietetic Association held its fourth annual convention in Houston, April 22–23, with headquarters at the Lamar Hotel. Sixty-seven members were registered.

The South Texas Dietetic Association complimented visiting dietitians and allied-trade members with a morning coffee at the Cohen House, Rice Institute. Irene Pope Hardy and Blake Bryson Patrick were hostesses.

The afternoon session was opened with a welcome from Blake Bryson Patrick, president of the South Texas Dietetic Association, and a response from Selma Streit, president of the Texas Dietetic Association. Lenna F. Cooper, President of the American Dietetic Association, spoke on "Current Activities of the National Association". Mr. R. A. Bancroft, Corrigan Jewelry Company, Houston, gave a most interesting discussion of the "History and Construction of Silver".

Social entertainment consisted of a bay shore drive and visit to the San Jacinto battle grounds, "fencing bout", and a "pirate dinner" held in the Cave Room of the San Jacinto Inn. Mamie Ruth Harris had charge of arrangements for the dinner.

Rose Richter, Methodist Hospital, Dallas, presiding at the Saturday morning session, presented Margaret Batjer of the Home Economics Department, University of Texas, who gave a demonstration lecture on "Flower Arrangements".

The South Texas Dietetic Association had Quindara Oliver Dodge, past president of the A.D.A., as their guest. "Professional Fellowship" was the title of the paper presented by Mrs. Dodge.

"The Effect of Vitamin Deficiency on the Nervous System" was discussed by Dr. Titus Harris, professor of neurology and psychiatry, medical branch of the University of Texas, Galveston.

Francis Low was hostess at the luncheon following the meeting, held in the Spanish Dining Room of the Lamar Hotel.

At the Saturday afternoon session, a round table discussion on "Variations in Menu Planning According to Different Types of Food Service" was led by Frances Ross Lawler, Baylor Hospital, Dallas. The following participated in the discussion: Rosalie Godfrey, business director of Residence Halls, University of Texas, Austin; Helen Deathe, home economics tea room, University of Texas; Helen Rabe Sloan, Nix Hospital, San Antonio; and Olive Black, school lunchroom manager, City Schools, Dallas.

The following officers were elected: Selma Streit, Scottish Rite Dormitory, Austin, president; Nell Morris, Home Economics Department T. S. C. W., Denton, president-elect; Rosa Spearman, supervisor of lunchrooms, City Schools, Dallas, vice-president; Helen Deathe, secretary; Gladys Lyons, Jefferson Davis Hospital, Houston, treasurer; and Helen Seago, John Sealy Hospital, Galveston, chairman of nominating committee.

The following section chairmen were

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Rennet enzyme, rennin, is a natural digestive principle; it transforms milk to a jelly consistence by acting upon caseinogen in the presence of calcium salts. In practice, the temperature of milk should range between 95–115 F., at 105 F. rennet action is most pronounced.

Whatever the origin, milk congealed by rennet has been enjoyed as a food for centuries.

Long ago an enquiring mind found it agreeable; later flavor and sweetening were added to improve the taste. The only change has been improvement of the rennet products used in its preparation.

JULLICUM, the new product—a liquid—reveals changes in all aspects relative to rennet-milk foods.

Quick Mixing, convenient, because rennet enzyme is dissolved.

Excellent Flavors, natural and pure.

Economical, approximately 4 cents to the pint of milk.

Almond Butterscotch
Caramel Chocolate
Coffee Orange
Raspberry Vanilla
Wine (New Flavor)

Price $1.25 the pint.
1 dozen to the case
Any assortment

Express or freight prepaid

SAM'L B. KIRK
1724 Cayuga St. Philadelphia, Pa.

Plain Jullicum, formerly Shinn-Kirk Liquid Rennet, is the oldest Rennet product in America; it has been sold by the Drug and Fancy Grocery trades since 1857.

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appointed: Professional Education, Mamie Ruth Harris, Hermann Hospital, Houston; Administration, Mary Lee Bolling Clark, S. M. U., Dallas; Diet Therapy, Rose Richter, Methodist Hospital, Dallas; and Community Education, Lilly V. Lane, Texas School for the Deaf, Austin.

The formal banquet honoring the twenty-six charter members of the association was the final event of the convention. It was held at the Junior League Luncheon Club with Mary Smith and Helen Mims as hostesses.

Much of the credit for the success of the meeting should be given Mary Smith, chairman of the Program Committee.

Miniature oxcarts filled with poppies, gourds, a sombrero and small Mexican figures, helped to carry out the Mexican theme in a breakfast given by the South Texas Dietetic Association in honor of their guests, Quindara Oliver Dodge and Lenna F. Cooper. The guests were each presented a book of etchings by a famous Texas artist.

The Tri-State Hospital Assembly was held May 4–6 at the Stevens Hotel, Chicago. A program for dietitians was planned by the Indiana, Wisconsin and Illinois Dietetic Associations. Members of these associations gathered for dinner on Wednesday evening and held a group meeting on Thursday. Frances Floore, director of dietetics, St. Luke's Hospital, Chicago, acted as program chairman for this meeting.

Mead Johnson & Company suggest the use of Mead's Oleum Percomorphum in the summertime. Fat tolerance is lowest during the hot weather and due to its negligible oil content and small dosage Oleum Percomorphum does not upset the digestion. Its use is strongly indicated for prematures and for insurance against rickets, since sunshine alone does not always prevent or cure rickets. Samples of Oleum Percomorphum for clinical use during the summer months to replace cod liver oil are available on application to Mead Johnson & Company, Evansville, Indiana.

Hoffmann-LaRoche, Inc. The *Roche Courier* has reprinted an article by Professor Szent-Gyorgyi, entitled "Do We Set our Standards of Health too Low?" He believes that "by no other means will so much human suffering be banished as by the correct understanding and employment of vitamins."

Hoffmann-LaRoche announce that Vitamin C 'Roche' is now available in trade packages containing 40 tablets, each of which contains 100 mg. of ascorbic acid.

Perennial Parsley Produces Poetry. The May issue of the *Bulletin* of the Minnesota Dietetic Association includes the following verses by a rebellious Minnesota dietitian:

SPRIG FEVER

Parsley, parsley everywhere
On my daily bill of fare.

See that kippered herring staring
At the silly sprig he's wearing.

Be it steak or creamed potatoes,
Oyster plant or grilled tomatoes,

Squash or scrambled eggs or scrod—
Each must wear its little wad;

Each must huddle underneath
Its accursed parsley wreath.

Parsley, parsley, everywhere.
Damn! I want my victuals bare.

M. F.

BASIC OPERATIONS IN COMMERCIAL CANNING PROCEDURES

IV. SEALING THE TIN CONTAINER

BRIEFLY, the method of food preservation commonly known as "canning" involves subjecting food in a permanently sealed container to a heat process. The heat process destroys spoilage organisms present on the raw food material; the seal on the container prevents reinfection of the food by such organisms. It is, therefore, obvious that the sealing operation—"closing" or "double-seaming" as it is known in the industry—is one of the most important in the canning procedure.

The manufacture of tinplate and "sanitary" cans is described elsewhere (1).

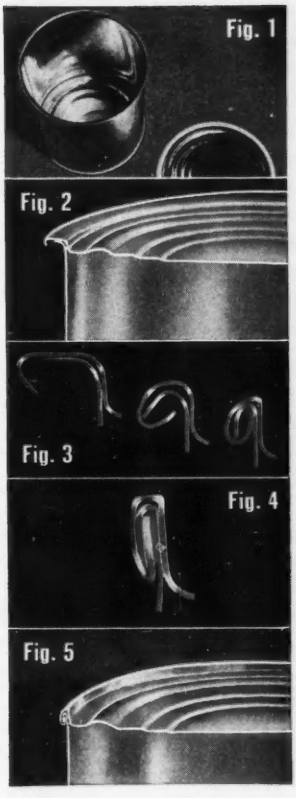
The open cans are received at the cannery in paper cartons or in washed paper-lined box cars, together with the covers which are contained in fiber shipping tubes. Figure 1 shows a can and end ready for use.

In modern canning practice, the cans are first conveyed by automatic runways to can washers, and thence to the filling tables or fillers where the correct amount of properly prepared raw food is put into the cans. The covers or "ends" are placed in the automatic sealing or "closing" machine to which the open can containing the food is mechanically conveyed. In this machine the ends are "double-seamed" onto the can. This operation is portrayed by the accompanying cross-sectional pictures.

In Figure 2 is shown the relation of can to cover before the sealing operation is started; note the relative position of the "curl" on the cover and the "flange" on the can. In this curl, the can manufacturer has placed a gasket or "compound," usually containing rubber. Figure 3 is a series of photographs illustrating the sealing operation in which the curl and flange are first rolled into position and then the layers of metal flattened together to form the final "double-seam" in Figure 4. The rubber compound originally present on the cover supplies the binding material between the layers of metal necessary to insure a permanent or hermetic seal on the container. Figure 5 illustrates in cross-section a closed sanitary can as it comes to the consumer.

In the past twenty-five years great progress has been made in the development of tinplate, compounds and automatic sealing machines. Collectively, these developments enable present-day canners to impose a permanent seal on the cans containing their products more easily and rapidly than ever before in the history of canning.

(1) The Story of the Tin Can, American Can Company, New York, 1935



AMERICAN CAN COMPANY

230 Park Avenue, N. Y.

ACCEPTED AMERICAN MEDICAL ASSN

The Seal of Acceptance denotes that the statements in this advertisement are acceptable to the Council on Foods of the American Medical Association.

WHO'S WHO IN THIS ISSUE

John R. Murlin received the Ph.D. degree from the University of Pennsylvania and the D.Sc. degree from Ohio Wesleyan University. Dr. Murlin was Harvey lecturer at the New York Academy of Medicine in 1917 and was appointed professor of physiology and director of the Department of Vital Economics of the University of Rochester in 1917. During the World War Dr. Murlin was director of the Division of Food and Nutrition of the Medical Department, U.S.A. He received his appointment as colonel in the Sanitary Reserve Corps in 1919. He served as chairman of the committee on food and nutrition of the National Research Council in 1919–22. Dr. Murlin is a member of the American Physiological Society, American Society of Biological Chemists, Society for Experimental Biology and Medicine, the American Chemical Society, and the American Institute of Nutrition of which he was president in 1934–36. Dr. Murlin has written numerous papers on physiological research, especially nutrition, and has contributed chapters on energy metabolism in Abt's *System of Pediatrics* and Barker's *Endocrinology and Metabolism*. Since 1928 Dr. Murlin has been editor of the *Journal of Nutrition*. He was a member of the White House Conference on Child Health and Protection, 1930–31, and a delegate to the International Conference, Health Section, League of Nations, in 1932.

James E. Fuller received the Ph.D. degree from Yale University. At present he is research professor of bacteriology, Massachusetts Experiment Station, Amherst. Dr. Fuller's research interests are chiefly concerned with sanitary bacteriology, especially water bacteriology; food bacteriology, with reference to fecal flora as influenced by diet; and physiology of bacteria. He has published papers in all of these fields.

Howard W. Odum received the LL.D. degree from Emory University, the Ph.D. degree from Columbia University and the Litt. D. degree from the College of the Ozarks. Dr. Odum was formerly research expert for the Philadelphia Bureau of Municipal Research; dean of the School of Liberal Arts, Emory University; Kenan professor of sociology since 1920; and director of the School of Public Welfare of the University of North Carolina, 1920–32. At present he is director of the Institute for Research in Social Science and dean of the School of Public Administration, University of North Carolina. Dr. Odum was member and assistant director of the President's Research Committee on Social Trends, 1930–33. Since 1933 he has been chairman of the North Carolina Commission on Interracial Cooperation, and secretary of the North Carolina State Planning Board. Dr. Odum is a former president of the American Sociological Society. Among his publications are *Social and Mental Traits of the Negro; The Negro and His Songs; Introduction to Social Research;* and *An American Epoch.* He is a contributor to the *American Mercury* and the *Saturday Review of Literature.*

David E. Lilienthal received the degree of LL.B. from Harvard University in 1933. He was formerly associate counsel for the City of Chicago and member of the Wisconsin Public Service Commission. Since 1933 Mr. Lilienthal has served as director of the Tennessee Valley Authority. He is a member of the National Power Policy Committee and the American Bar Association, and a contributor to legal publications.

Lavinia Engle is technical adviser for the educational division of the Social Security Board. She is a graduate of Johns Hopkins University and a former director of the Maryland League of Women Voters. Miss Engle served four years as member of the Maryland House of Delegates. She is a member of the Maryland State Planning Commission; chairman of the Montgomery County, Maryland, Welfare Board; legislative adviser for the Maryland Legislation Clearing House; member of the Board of Directors of the Tax Policy League; and chairman of the Children's Council of Maryland.

T. Swann Harding, B.S., is editor of the scientific publications for the United States Department of Agriculture. Mr. Harding has had eighteen years' experience in laboratory investigation in organic and biological chemistry, six of which were concerned with the nutrition of dairy cattle. He is the author of six books, one of which, *The Popular Practice of Fraud,* was reviewed in this JOURNAL for May 1935. Mr. Harding is a contributor to numerous magazines, journals and periodicals, and a regular contributor to the *Medical Record.*